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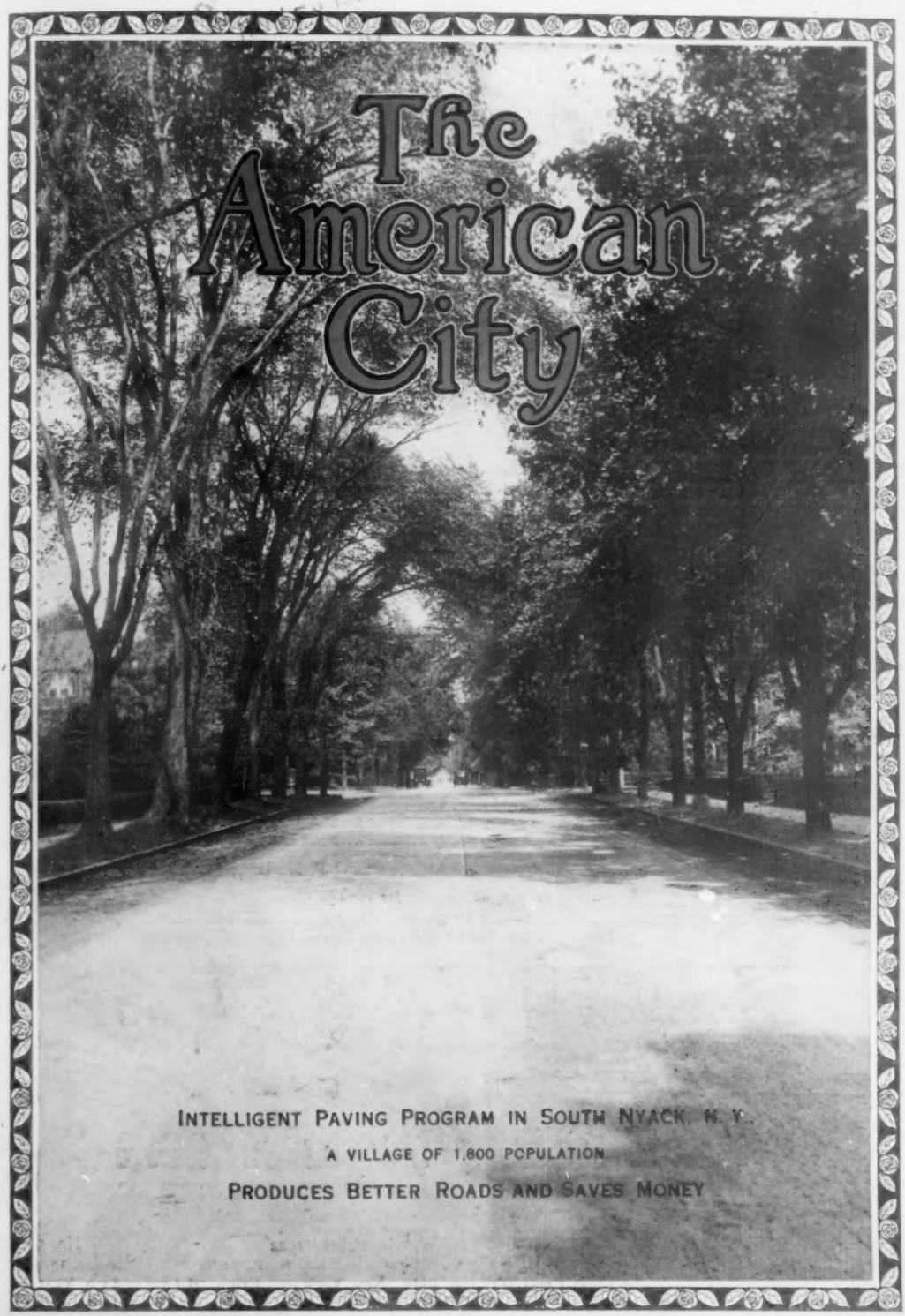
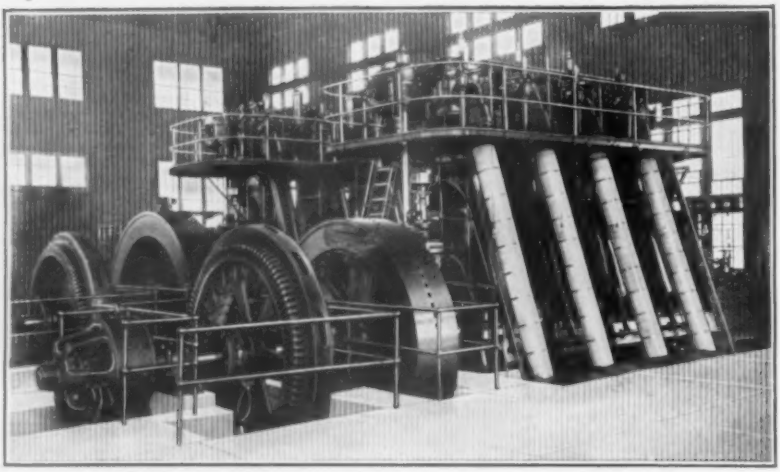


INTELLIGENT PAVING PROGRAM IN SOUTH NYACK, N. Y.

A VILLAGE OF 1,800 POPULATION

PRODUCES BETTER ROADS AND SAVES MONEY

Photograph by Phillips, Nyack, N. Y.



A Flour Mill That Bought Its Second Fulton Diesel

A flour mill had a 200 horsepower Fulton Diesel installed in 1913. Production increased. More Power was needed. And a second Fulton Diesel—a 285 horsepower engine—was installed in 1919.

Repeat orders for Fulton Diesels are not exceptions. They are expected. Reasons why can be told in a sentence—Burning low-grade fuel oil in internal combustion, the Fulton Diesel operates on one-third the fuel required to produce equivalent steam power, and attendants are reduced to one engineer.

The simple design and automatic operation of the Fulton Diesel, coupled with Fulton cooperation, make it easy for the plant engineer to become an expert. Our supervising engineers make regular visits to each Fulton installation to advise upon the most efficient methods of Diesel practice. Plant engineers interested in Fulton Diesel operation are cordially invited to St. Louis to visit our shops.

On request from executives and engineers our latest illustrated book describing the Fulton Diesel will be mailed free and postpaid. Our staff of engineers is ready at all times to advise on any power problem—anywhere—without charge or obligation.

FULTON IRON WORKS COMPANY, ST. LOUIS, U. S. A.

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FULTON DIESEL

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Volume XXVII Number 5

The American City Magazine

New York November 1922

New York State Cities Cooperate on Fuel Problem

TEAM work among the cities of the state of New York has reached a very high degree, as is evidenced by the way they are working out their common fuel problems.

When it became apparent that the country as a whole faced a fuel shortage, the New York State Conference of Mayors and Other City Officials, which for twelve years has been building up a spirit of cooperation among city officials, stepped into the breach. At that time there existed an official Emergency State Fuel Commission. At the request of that body the Conference sent out a preliminary letter of inquiry to all the cities of the state, from which a rough picture of the situation was obtained. It was evident, however, from the replies that a much more careful survey was required, and accordingly a detailed questionnaire was sent out a little later. This asked specific information as to the number of tons of anthracite and bituminous coal on hand and needed by the city offices, police stations, fire houses, hospitals, both public and private, water-works, municipal electric light plants, public schools, sewage disposal plants, municipal baths, municipal libraries, municipal ferries, and other public buildings, institutions or enterprises within the city. The questionnaire further asked information as to how many tons of both anthracite and bituminous coal would be needed month by month from September to March, inclusive.

When these data were received, they were compiled on charts such as are shown on a small scale in the diagram on page 390. With this information tabulated by cities, it became a simple matter to tabulate it for the entire state and to ascertain how far the amount of coal allotted to New York State for public purposes would go toward filling the actual need.

From this survey it has become apparent that the probable supply will not equal the normal anthracite consumption this winter. Fortunately, there is plenty of bituminous coal, and just recently the ban has been lifted on pea coal. The Fuel Committee of the Conference of Mayors, which meanwhile had been invited by the new Fuel Administrator to occupy space in his headquarters, thereupon sent a letter to each of the mayors asking his cooperation in the matter of suspending for the duration of the emergency any local anti-smoke ordinances or any health regulations which might prevent the use of bituminous coal. This was followed by a letter pointing out how, in the particular situation described by the city in its report, a mixture of bituminous and anthracite coal could be employed to eke out the scanty anthracite supply. The accompanying letter to Mayor John H. Walrath of Syracuse is a sample of this type of communication:

October 9, 1922.

Honorable John H. Walrath,
Mayor,
Syracuse, N. Y.

My dear Mayor:

The report you sent to us about the coal supply and needs of your city departments shows that you have on hand only 1,954 tons of anthracite coal and that you will need 13,390 tons; also that you have on hand 238 tons of bituminous coal and will need 3,683 tons.

No.....
Date .....

Fuel Committee of the New York State Conference of Mayors. Coal Report
Name of City .....

W. P. Capes, Secy.
State Grand Central Terminal
New York City

Department	On hand		Amounts required. Anthracite								Amounts required. Bituminous								Tons Contracted for		Name of Contractor	Amount Delivered
	Anth.	Bit.	Sept.	Oct.	Nov	Dec	Jan	Feb	Mch	Total	Sept	Oct	Nov	Dec	Jan	Feb	Mch	Total	Anth.	Bit.		
City Offices																						
Police Stations																						
Fire Houses																						
Hospitals (pub. & private)																						
Water Works																						
Municipal El. & Rwd.																						
Public Schools																						
Sewage Disposal Plant																						
Municipal Baths																						
" Libraries																						
" ferries																						
Other uses																						
Totals																						

Can other fuel substitutes be used?

CARD FORM USED FOR REPORTING THE FUEL SITUATION IN INDIVIDUAL CITIES

You should have no difficulty in obtaining bituminous coal from your regular dealers. We, however, advise you to get your order in immediately, as there is liable to be an acute car shortage very soon.

It will be exceedingly difficult to obtain anthracite coal in any quantities for some time. We therefore urge you to arrange immediately to use bituminous coal in your city buildings and schools as long as the emergency exists. If possible, hold the 1,954 tons of anthracite in your public schools, hospitals and city buildings, and distribute it to essentials (such as hospitals, bakeries, laundries, etc.), which cannot under any conditions burn soft coal. By so doing, you will conserve the small supply of anthracite and help to avert a crisis. Even a mixture of anthracite and bituminous, with as large a percentage of bituminous as you can possibly use, will help out in the present emergency.

If you should have any difficulty in obtaining coal through your local dealers, please advise us and we shall immediately solicit the aid of the State Fuel Administrator and his District Representatives.

Very truly yours,

W. P. Capes,
Secretary, New York State Conference of Mayors and Other City Officials.

As a result of these letters, but more particularly as a result of the habit of co-operation developed during the last decade, every city responded. In all but one, ordinances and health regulations prohibiting the use of bituminous coal have been temporarily suspended, and all the cities are co-operating in assuring a fair allocation of the available supply.

Officials in other states may be interested in the organization of the fuel administration which has brought this about. At the head is William H. Woodin with his group of technical advisors. Immediately below him is a state committee consisting of one representative each for the utilities, the cities, the retail distributors, and the wholesale distributors. The chairman of this advisory committee is the Assistant Administrator, Harry T. Peters. In each of the nine judicial districts there is a similar district advisory committee, with the district administrator as chairman and one representative each for the utilities, the public bodies, the retail, and the wholesale distributors. Districts 1 and 2, the city of New York and Suffolk County, have been combined, but throughout the others the organization is identical. The result is that the Administrator has not only his technical consultants, but an advisory committee of various interests to meet the various problems which arise, and each of his deputies in the judicial districts is likewise equipped to handle local situations.

Snow Removal by Counties

Tractors, Motor Trucks and Road Machinery Used Extensively

IN response to inquiries sent to all counties above the snow-line in the United States, interesting replies showing the forces employed, the type of equipment used, the cost, the number of miles of highway kept open and the approximate number of men employed in this type of work were received from slightly over 100 counties. The outstanding point of interest in this survey is the fact that in practically all cases county forces are employed to keep the roads open. The equipment consists in many cases of hand shovels and horse-drawn plows, although the majority of counties employ motor trucks and tractors equipped with plows of one type or another, or make use of the regular types of road graders to pile the snow at the sides.

EVEN THE HORSE IS CALLED UPON TO KEEP COUNTY ROADS OPEN IN GRANT COUNTY, WIS.

In Massachusetts the work has been taken over by the State Department of Public Works, which acts with the towns and cities in keeping all essential roads open. In Rhode Island the work is now handled by the state, where up to a year ago all snow removal was handled by the various towns within the state.

The costs of removal vary greatly, depending chiefly upon the extent to which roads are kept open and the intensity of the snowfall within the district. It is interesting to note also that an increasingly large number of roads are kept open during the winter, thus showing the appreciation of highway transport at all times of the year.

10-TON HOLT TRACTOR AND SNOW-PLOW USED BY DELTA COUNTY ROAD COMMISSIONERS, MICHIGAN, TO KEEP ROADS OPEN IN WINTER

VIEW OF THE BACK OF THE SNOW-PLOW USED BY THE DELTA COUNTY ROAD COMMISSIONERS, MICHIGAN, TO OPEN UP A ROAD TO ITS FULL WIDTH

SNOW REMOVAL BY COUNTIES

State and County	Removal Done by	Equipment	Cost 1921-22	Miles Highway Kept Open	Number of Men Employed
COLORADO					
Saguache	County forces	Motor trucks with plows, tractors, graders, etc.	$500	12	....
DELAWARE					
Kent	All highways cleared by state	Trucks with blade scrapers, tractors with blade scrapers	$1,300	200	....
IDAHO					
Benewah	Not practiced except in cases of exceptional drift	By hand	50	....	....
Butte	Not practiced	....	....	....	....
ILLINOIS					
De Kalb	No attempt to remove snow	....	....	....	....
Douglas	No snow removed	....	....	....	....
Lake	County	....	No snow	15	As required
Scott	Not systematically practiced	....	....	....	....
Williamson	No snow removal done	....	....	....	....
INDIANA					
Hendricks	County forces	....	Nothing	400	None
Jackson	Not very much snow for four years	Teams, men, shovels and graders	Nothing	None	None
Jennings	County or township	Seldom necessary to remove snow	....	....	....
Rush	County forces	Motor trucks and V drags	No record	175	....
Vigo	Do not attempt to remove snow	....	....	....	....
IOWA					
Chickasaw	County day labor crew	Motor trucks, Holt tractors and graders	$680	47	4
Dallas	County forces	Tractors and graders	800	70	6 to 8
Des Moines	County forces	Tractor and grader	Nothing	....	....
Dubuque	County forces	Holt tractor with locomotive plow	....	40	....
Fayette	County forces	Team and small grader; heavy drifts only opened for light traffic	....	....	....
Floyd	County forces	Holt tractor, plow and graders	Too much for benefit received	18	2 to 6
Hamilton	No snow removed	....	....	....	....
Humboldt	County forces and extra men	Motor trucks and graders pulled by horses	$200	42	7
Lyon	County forces	Holt tractor and graders	Very light	23	2
Monona	County forces	Holt 5-ton tractor pulling Adams Blade or Duplex Maintainer	$504.50	31	2
Pottawattamie	County patrolmen	Bolton road maintainers and four horses	No record	148	28
Worth	Day labor	Drifts only removed	....	....	....

SNOW REMOVAL BY COUNTIES

State and County	Removal Done by	Equipment	Cost 1921-22	Miles Highway Kept Open	Number of Men Employed
KANSAS					
Clay	No snow removal		....	....	....
Finney	County gang	Trucks for transportation of men only	$765	28	10 to 15
Graham	County forces	Hand shoveling	75	100	20
Kingman	County forces	Tractor with graders and snow-plow	2,000	150	50
Osage	County forces	Tractor with Baker plow, teams, trucks with wedge frames	300	207	100 for 1½ days
Riley	County forces	Motor trucks with snow-plows	....	166	8
Shawnee	County forces	Motor trucks with A-frame plows	Incomplete	250	Varies
Wabaunsee	County forces	Two trucks with drags and 25 horse-drawn drags	$500	180	40
KENTUCKY					
Adair	Not enough snow to retard travel		....	....	....
Barren	Not removed		....	1,200	....
Caldwell	Snow never gets deep		....	....	....
Owen	County forces	Motor trucks and graders	Nothing	....	....
MASSACHUSETTS					
Essex	County has no connection with this work	State D. P. W. acts with towns and cities	....	....	....
MICHIGAN					
Branch	County gang	Motor truck equipped with plows	$200	100	10
Delta	County forces	10-ton Holt tractor, 20-foot Levy plow, 5-ton truck with locomotive plow	2,500	50	4 to 6
Dickinson	County forces	Tractors and plows	8,500	75	25
Ionia	County forces	Motor trucks, tractors, graders	50	33	2
Kent	County forces	Motor trucks with scrapers, tractors, graders, snow - plows, motor trucks with plows	394 80	40	100
Macomb	County forces	Motor trucks with plows and graders	1,500	235	6 to 25
Otsego	Not removed	Snow-rollers	....	5	....
Washtenaw	County forces	Motor trucks with snow-plows, graders and 10-ton tractor	....	125	....
MINNESOTA					
Aitkin	Townships remove snow		....	....	....
Brown	County forces	Blade graders, teams and men with shovels	242 68	118	Varies
Isanto	County forces		200	85	13
Norman	No snow removal undertaken; no funds available		....	....	....
Pennington	Only occasional opening of bad drifts	3 motor trucks, small snow-plow, maintenance graders	....	.....	....
Swift	No provision made for snow removal		....	....	....
MISSOURI					
Callaway	No regular system; mostly donated	Teams and road graders or V-shaped drag	Unknown	25	....
Cole	County forces		Nothing	....	....
Johnson	County forces	Motor trucks with graders, Havelock maintainers, drags, and large A-shaped drags	....	....	....
Lincoln	No official attention given to snow removal		....	....	....
Livingston	Nature—wind, rain and sunshine		....	....	....
MONTANA					
Beaverhead	County	Motor trucks, caterpillars and graders	Unknown, not segregated	....	....
Cascade	County forces	Caterpillar tractor and power grader	$2,050	50	....
Chouteau	County	Occasional drifts shoveled by hand	....	....	....
Granite	Travel does not warrant snow removal		....	....	....
Park	County forces	Practically nothing, only occasional drifts shoveled	No record	....	....
Wheatland	Snow occasionally dug out of heavy cuts		....	....	....

SNOW REMOVAL BY COUNTIES

State and County	Removal Done by	Equipment	Cost 1921-22	Miles Highway Kept Open	Number of Men Employed
NEBRASKA					
Chase	County forces	Motor truck and graders	$100	49	6
Douglas	Day labor	3 trucks with plows, 2 tractors with graders	....	30	....
Fillmore	County	Motor trucks equipped with graders	No snow	....	....
Jefferson	County maintenance crews	Motor trucks, tractors and graders	Not segregated	30	4
Otoe	County forces	6 FWD trucks, 2 Holt tractors with snow-plows	....	62	8
Thayer	County forces and hire	Trucks, blades and tractors	Nothing	....	None
Webster	No snow removal	....	....	....	....
NEVADA					
Humboldt	County forces and private accounts	Snow-plows and other home-made methods	No record	250-300	No record
NEW JERSEY					
Salem	County forces	Scrapers	$2,000	100	....
Union	County forces, contract and State Highway Department	Motor trucks equipped with plows	....	....	....
NEW YORK					
Delaware	Towns	Graders	....	....	....
Madison	Town forces	Motor trucks and horse-drawn plows	$500	1,422	....
Oswego	Town forces	Horse-drawn snow-plows and snow-rollers	$29,149.18	700	50 to 300
St. Lawrence	Town forces	....	....	....	....
Schenectady	Town forces	Motor trucks and tractors equipped with plows and graders	Unavailable	25	....
Schoharie	Townships	Motor truck, Lynn tractors	....	50	....
Tompkins	No snow removal by county	....	....	....	....
Washington	Town forces	....	....	1,500	....
NORTH DAKOTA					
Bottineau	None	....	....	....	....
Bowman	Individual	....	....	....	....
Morton	County—day labor	Tractors, graders, fresnos, etc	....	....	....
Williams	No snow removed	....	....	....	....
OHIO					
Allen	Not removed very often	....	....	....	....
Ashland	County forces	5-ton White truck and snow-plow	$600	30	3
Clinton	County and township forces	None	....	....	....
Darke	County and township forces	None	Very small	....	....
Fairfield	Township	....	....	....	....
Hardin	Township	None	....	All	None
Lake	County	2 trucks with plows	$420	60	8
Madison	Township forces	Drags	No snow	....	....
Ottawa	Township	Tractors and graders	Nothing	....	....
Ross	Very little snow removed	Wooden drag drawn by team	Very little	10	2 or 3
Seneca	Township	....	Nothing	1,280	None
Trumbull	County forces	Motor trucks equipped with plows and graders	$255	80	20
Washington	Nature	Sunshine and rain	....	....	....
Wyandot	Township—day labor	Wooden snow-plows and graders	Nothing	All	None
PENNSYLVANIA					
Centre	State	Plows and graders	....	....	....
Chester	State	2 Nash Quad trucks with snow-plow attached	$8,000	120	400
Crawford	Township or state	....	....	....	....
Monroe	State forces	Motor trucks equipped with plows	....	30	....
Sullivan	Township on all except state highways	By hand	....	....	....
RHODE ISLAND	No county highway organizations. State roads kept open by state maintenance forces. Motor trucks with plows, tractors with plows, road scrapers and graders		$13,300	360	150
WISCONSIN					
Adams	No snow removed by Co	....	....	....	....
Ashland	County forces and Northwestern Transportation Co	10-ton Holt tractor and snow-plow	700	60	10
Columbia	No snow removed	....	.....	....	....
Grant	Townships	....	....	....	....

Erie Has Model Municipal Piggery

By George F. Paul

THE city of Erie, Pa., prides itself on having what is declared by experts to be one of the finest municipal piggeries in America. At present the 1,400 hogs are consuming from 30 to 35 tons of garbage per day. Those in charge have been able to fatten hogs for market in from four to four and one-half months. This fattening is carried on without the annoyance of a disagreeable odor, or any other nuisance. The hogs that have been marketed have withstood a more severe physical test, and have shown much less disease, that it is estimated that by the end of 60 days on such feed the hogs are rendered from 90 to 95 per cent immune to cholera, even when subjected to the most severe exposure. Not only are the hogs rendered free from cholera, but they are also treated against swine plague and other diseases. The death loss from all causes is a fraction less than 2 per cent.

Pigs Replace Incinerator

In 1913 an incinerator was built to take care of the city's garbage, but it cost so much to operate it that the piggery was built, and the pigs were bought, and put to work. This modern hog-house is 360 feet long and 50 feet wide, with walls of concrete block. It is divided into pens, each pen affording room for 125 pigs. The pens are bedded with baled shavings, which keeps the hogs clean and dry at all times. The sleeping quarters are kept entirely separate from the feeding platforms, which are immediately in front of the sleeping quarters. These platforms are of concrete and are flushed daily to keep the pens in a

A SCENE AT THE GARBAGE DISPOSAL PLANT, ERIE, PA.

than the hogs raised by the ordinary farmer.

The hogs are all treated with a serum to render them immune to cholera before they are placed on feed. Not a single hog has been lost from cholera at this piggery. The very nature of the feed in a garbage-feeding plant is conducive to cholera, and hogs not so treated would not live in such plants. The inoculations render the hogs immune, to the extent of warding off the disease which might be produced by such feed, and by feeding on food of this nature they are daily setting up additional immunity, so

clean and sanitary condition. Bucket conveyors bring the garbage to the feeding platforms. The pigs are turned into the pens and allowed to eat at will. They are then driven into their sleeping quarters, and the feeding floors are thoroughly cleaned.

The hogs are put on garbage feed very carefully for the first ten days after arrival, only being permitted to consume a small quantity of garbage until they have become accustomed to their feed. No grain is fed at any period during the hogs' stay at the ranch, which ranges from four to five months.

Every means has been used to erect a model pig farm. Both county and state officials have visited the farm and know that the pens are of the most sanitary type and can be kept clean at all times. Plenty of fresh air and light help to keep the piggery sanitary. In this respect it is absolutely different from the pig-pen of the old-fashioned type.

The proposition is declared to be a successful and profitable one.

Special Assessments for Local Improvements

By A. L. H. Street

THE existence of general power in a state to authorize its cities, towns and villages to construct local improvements at the expense of property benefited thereby has long since ceased to be a debatable legal proposition. And, although the law reports continue to be augmented in volume by court opinions dealing with the validity of particular assessments, the limitations existing upon this general power are probably as well defined by judicial authority as may be expected in the face of a flood of statutory amendments which subsides only when all the legislatures of the several states happen to be in a state of adjournment.

Frequently it has been decided by courts of last resort that municipalities have no inherent power to levy assessments for betterments. The power must be expressly conferred by authority from the state, and the state itself is limited in the power which it may delegate. As pointed out by the Massachusetts Supreme Judicial Court in White vs. Gove, 183 Mass. 333, and decisions of the courts of Arkansas, Michigan, New Jersey, Ohio, Oklahoma, Pennsylvania, Texas, and other states, there is a constitutional bar to the levy of assessments exceeding improvement benefits derived by the assessed property.

The nature of an improvement that will constitute it "local" in such sense as to authorize a special assessment on benefited property has been the subject of many lawsuits. The test generally applied is that of special benefit. And, according to the holding of the Missouri Supreme Court in Kansas City vs. Railroad Company, 230 Mo. 369, the benefit must accrue from the present plan of improvement adopted, without reference to prospective benefits to accrue from a general plan not yet adopted.

Summarizing various decisions of state appellate courts, a standard legal authority says, concerning assessments on account of street improvements:

> "Authority to pave the roadway or to construct gutters is not to be implied from power to improve sidewalks. Planting shade trees and boulevarding a street may be deemed an improvement thereof within the meaning of the statute [citing Heller vs. Garden City, 58 Kansas Supreme Court Reports, 263, and Downing vs. Des Moines, 124 Iowa Supreme Court Reports, 289]. The term 'pave' has been held to include macadamizing a street or flagging it, and constructing gutters. . . . But under a power to pave, a city may not levy an assessment for a change of grade, unless such change is a mere incident of the paving [citing decisions of the courts of Ohio, Wisconsin and Washington]." 28 Cyc. 1109-1110.

Under appropriate charter or statutory authority, assessments for special benefits derived from lighting improvements have been upheld. See decision of Illinois Supreme Court (129 N. E. 580), of New York

Supreme Court (142 N. Y. Supp. 523), and of Washington Supreme Court (159 Pac. 806). But a decision of the Indiana Supreme Court (111 N. E. 926) reminds us that there must be express authority for apportioning costs by special assessment—that authority to assess for lamp-posts will not justify an assessment for the cost of a distributing system.

Under a decision of the Maryland Court of Appeals (61 Md. 224), which is supported by holdings of courts in other states, the cost of paving a street intersection may properly be included in assessing the entire cost of a street improvement, where there is no charter or statutory requirement for the bearing of this expense by the city.

Numerous decisions uphold the right of a city to levy assessments for street repairs under general power to improve streets and levy special assessments therefor.

As to sewers, it has been decided by a Pennsylvania court that the fact that certain property is served by a private sewer will not exempt the property from assessment for the construction of a public sewer system. (In re Broad St., 9 Kulp Reports, 37.) My impression is that there is a decision to the same effect in one of the early volumes of the Kansas Supreme Court Reports. In a comparatively recent case (129 N. E. 71), the Illinois Supreme Court decided that the cost of a station to pump sewage was a proper item to be apportioned by special assessment for a sewer improvement, and in another recent decision (223 S. W. 615) the Missouri Supreme Court ruled that all property within a sewer district may be assessed on account of the expense of all laterals required therein. But all of the decisions require to be borne in mind the fundamental principle that there must be a reasonable relationship between individual benefits and corresponding assessments.

The general principle applicable to all assessments for city betterments, drawing a distinction between improvements which benefit the public at large and those which create special benefits in addition to public ones, is applied to the construction of waterworks and mains. There appears to be no judicial dissent from the proposition that assessments may be levied to cover special benefits derived through construction of a water-main along a given street, or through connections constructed for lots. But, in so far as a water-works system serves all of the inhabitants generally, it cannot be regarded as such local improvement as will support special assessments.

There is a conflict of decisions concerning the right to levy assessments for street sweeping and sprinkling. See 28 Cyc. 1110.

The right to assess for park improvements conferring special benefits, under conferred authority, has been recognized in several authoritative decisions.

The general rule laid down by the courts is that it is the actual benefit to the property that controls the right to assess. If such benefit accrues, it is quite beside the point that, because the owner presently uses the land for agricultural purposes or some other special use, or does not use it at all, there is no benefit from the standpoint of present use of the property.

Exemption of property of cemeteries, schools, religious corporations, charitable institutions, and other similar organizations, depends upon statutory or constitutional provision to that effect, or upon lack of benefits. It is generally held that an exemption of such property from "taxation" is insufficient to exempt from special assessments for local improvements.

No express exemption is required to exempt from assessment, although benefited, the property of the United States, or of the state. A conflict of decision exists on the point as to whether property of a county or school district is exempt in the absence of special statutory exemption. (See 28 Cyc. 1117.)

Irregularities in council proceedings account for a large volume of litigation over special assessments. As decided in numerous cases, a substantial departure from charter or statutory authority will invalidate an assessment against property where the owner makes timely objection. But assessments will not be disturbed on purely technical grounds. Illustrations are afforded of vital irregularities in cases where a statutory requirement for initiation of a local improvement proceeding by petition of property owners is not observed (59 California Supreme Court Reports, 206), or where there is an omission of a preliminary estimate of the cost, required by statute (5 Minnesota Reports, 95) or where a required resolution of necessity is not

preliminarily adopted by the city council (28 Cyc. 1135). Fatal irregularities have also occurred in municipal experience in failing to observe statutory and charter requirements designed to secure construction of public improvements by lowest responsible bidders.

Authority granted to levy special assessments is usually coupled with specific provisions for due notice to all interested parties of hearings at various stages of the proceedings, with full opportunity to such parties to be heard on any objections, with a right to review in the courts. There is, also, special provision limiting the time within which attack may be made upon the proceedings. Taken together, the statutes therefore harmonize the right of the property owner to be heard on objections to irregular proceedings, excessive assessments, etc., with the practical necessity for timely objection.

The courts of Colorado, New Jersey, New York, North Carolina, Oregon, Vermont, and other states, have firmly established the rule that a court in reviewing an assessment proceeding is powerless to substitute its opinion for the judgment of municipal authorities concerning the necessity for, or reasonableness of, an improvement ordered, excepting where such authorities manifestly have abused the discretionary powers vested in them.

In Iowa, Kansas, Maryland, Massachusetts, Ohio, and Wisconsin, and in other states, it has been decided by the supreme courts that invalidity of an ordinance under which an improvement has been ordered, or other irregularities invalidating a local assessment originally made, do not preclude the making of a reassessment under new proceedings regularly had. Statutes providing for reassessments in such cases generally exist in the several states and have been upheld by the courts as against constitutional objections. Thus means are afforded for levying an equitable assessment for an improvement already constructed, despite the void character of the original assessment.

Public Health Administration in Asbury Park, New Jersey

By B. H. Obert
Health Officer, Asbury Park, N. J.

THE city of Asbury Park is located on the New Jersey shore of the Atlantic Ocean, 50 miles south of the city of New York and 78 miles from Philadelphia. According to the United States Census Bureau, its estimated population as of July 1, 1922, is 12,966, increasing during the summer season to a minimum population of 75,000 and a maximum population of 100,000.

Early in its history Asbury Park awakened to its responsibility, as a resort center, of protecting the people sojourning there, and emphasized the importance of public health work. In 1880, the first Board of Health was established, and since that time Asbury Park has been one of the leading cities in the state of New Jersey in its public health administration. The city is governed by a Board of Commissioners, which constitutes the Board of Health. The Bureau of Health is operated under the Director of Public Safety. The staff includes a full-time health officer, a clerk, a sanitary inspector, a special inspector, and a part-time physician. A public-school nurse is employed by the Board of Education, who cooperates with the Bureau of Health.

The operation of the department is divided as follows: communicable diseases; enforcement of sanitary laws; child welfare; foods; hygiene and sanitation; vital statistics; laboratory; education and publicity; garbage, rubbish, dead animals and stable manure; plumbing; and public platform scales. In the effort to prevent the spread of communicable diseases, we try to locate the source of infection and to take such measures as are known to be

effective to prevent their spread. A separate card record is kept of each case reported to the department. In cooperation with the Board of Education, all children attending the public schools are required to be successfully vaccinated upon entering school, or to produce from a physician a certificate that they have been successfully vaccinated within five years, and to be revaccinated at the end of each five years. Each year free vaccination is offered to all children and adults. The Bureau of Health furnishes for indigent cases vaccination against smallpox and typhoid fever; also the Schick test and immunization against diphtheria. The Schick test and immunization against diphtheria is being recommended and urged for all children attending the public schools. Diphtheria antitoxin is provided upon request.

The city owns a municipal hospital equipment consisting of fire-proof buildings, modern and up-to-date in every respect, for persons suffering from scarlet fever, diphtheria, and smallpox. Only one death has occurred from typhoid fever in Asbury Park since 1913; one death from scarlet fever since 1911; eight deaths from diphtheria in the past ten years; and not one death from malaria has occurred in the past ten years, owing to the fact that Asbury Park is free from mosquitoes.

Accurate Computation of Infant Mortality Rate

The infant mortality rate, under one year, per 1,000 reported births for year 1921, was 48.5. This rate is as near a true rate as we are able to get and includes all births of babies that have occurred outside of Asbury Park whose mothers are residents of the city, and also all deaths of resident babies who have died outside of the city. The total resident death rate for Asbury Park for the year 1921 was 13.4 per 1,000. The State Bureau of Vital Statistics assists us in obtaining these records.

Milk and Food Inspection

Strict supervision is maintained over the milk supply for the city by inspection of dairies, of the method of transportation and of the plants in the city, and by frequent analyses of samples. About 95 per cent of all milk consumed in the city is pasteurized in thoroughly up-to-date plants, licensed and supervised by the State Department of Health and also supervised by the local department. Inspections are made of foods in warehouses and stores, and those served at hotels, boarding-houses and restaurants. At all soda fountains and places where soft drinks are dispensed, it is required by ordinance that beverages be served in individual containers, used but once, or in glasses which have been sterilized at least five minutes by submersion in boiling water, or have been exposed to live steam in a suitable sterilizer.

Water-Supply and Sewerage

Every residence property in the city is connected with the public sewerage system. There is not a vault, cesspool, or shallow well for domestic purposes in the city. The water-supply is obtained from artesian wells, varying in depth from 800 to 1,200 feet, owned and operated by the city. Approximately one-third of the city, which is a residence section, is served by a private water company. This supply of water averages 35 per cent surface and 65 per cent artesian from wells about 1,000 feet in depth. A separate record with diagram is kept of each property. Loose-leaf books, one for each street, are used for this purpose.

Collection and Removal of Wastes

The collection, removal and disposal of garbage, rubbish, dead animals, stable manure and ashes is performed by contract, the supervision of which is under the Bureau of Health, with the exception of ashes, which is under the Departments of Streets and Police. Three collections of garbage a week, throughout the city, are made from October 1 to June 1, and six collections a week from June 1 to October 1, excepting in the hotel and business districts, where six collections are made per week throughout the year. All these materials are collected from the places where stored on the property. No garbage or rubbish is placed on the street curb. Garbage is disposed of by feeding to hogs, and the rubbish is first culled and the residue used for filling low lands. A place for the disposal of these waste materials is provided by the contractor. Dead animals are removed daily upon notice, and ashes are removed once a week from the street curb.

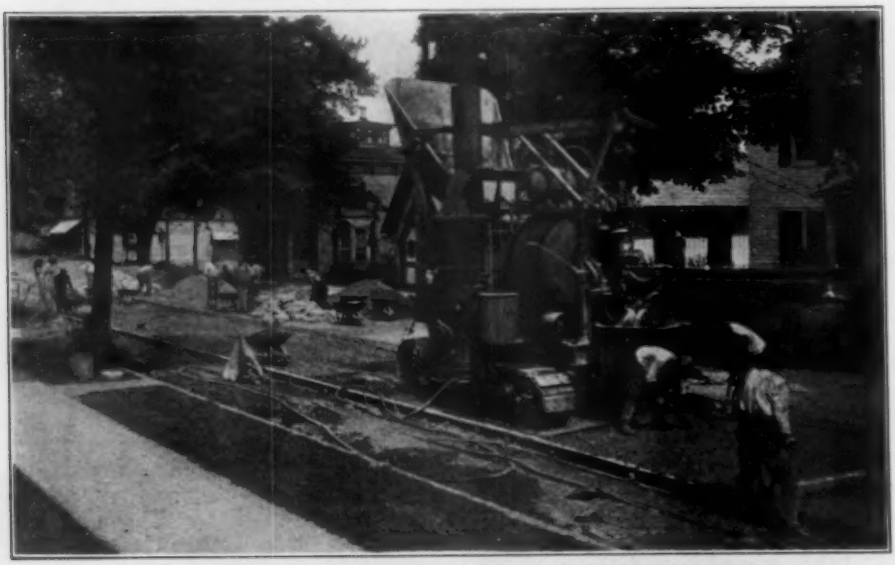
Progress vs. Patchwork—Economy in Small-Town Street Construction

Proper Choice of Pavement and Intelligent Financing Make Large Economies Possible in South Nyack, N. Y.

By J. J. Dobbin
Village Clerk, South Nyack, N. Y.

NOT infrequently a small town or village is paying relatively large sums annually for the up-keep of its main streets which are heavily traveled by trucks, automobiles and other vehicles, many of which do not stop within the corporate limits. This type of traffic wears out the macadam or other cheap roads and forces exceedingly high maintenance charges on the community.

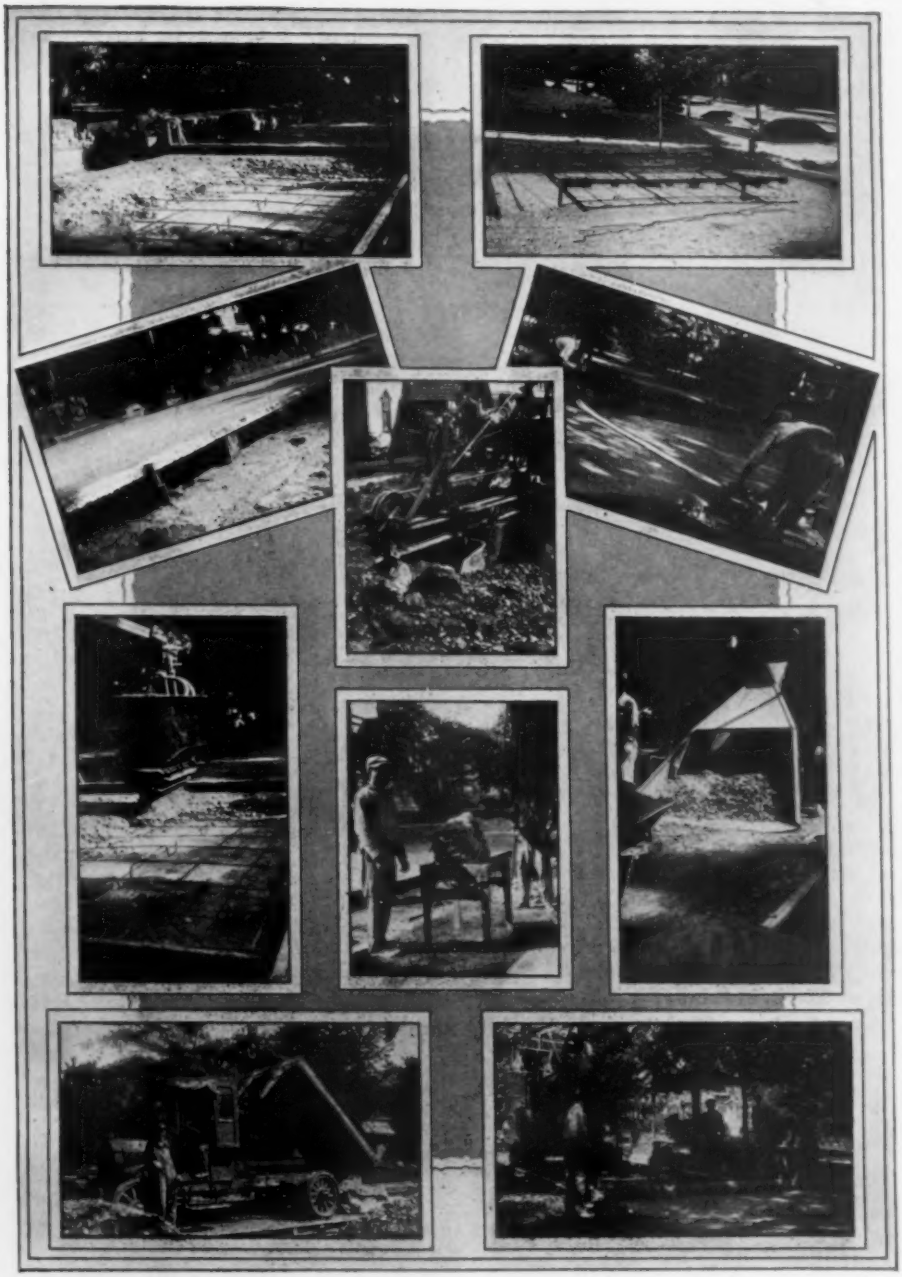
An interesting example of the way in which a village of about 1,800 population, with an assessed valuation of $2,100,000, is increasing its bonded indebtedness and making possible a decrease in taxes at the same time, is found in South Nyack, N. Y. On March 21, 1922, the taxpayers authorized the expenditure of $46,000 for the construction of a reinforced concrete roadway on a portion of South Broadway and Piermont Avenue, which form part of the main thoroughfare on the west side of the Hudson River which passes through the village for about one mile. This road is built 24 feet wide for most of its length and 18 feet wide for the remainder, where its width is limited by present property boundaries.



PAVER NEARING COMPLETION OF SECOND HALF OF CONCRETE ROAD

The half of the pavement completed first was used for the storage of aggregate and cement, as a satisfactory detour was available

The estimated cost of the new road is about $45,000, and for additional paving in connection with a state highway, which will also go through a portion of the village, $5,000 was voted, making a total of $50,000. To provide for this bond issue of $50,000, 25-year 5 per cent serial bonds were sold



CONSTRUCTION PICTURES OF SOUTH NYACK'S NEW CONCRETE STREET

At left, top to bottom, pre-bent reinforcing mat in place; road finished to top of forms; dumping a batch; delivering cement on the job. At right, top to bottom, frame for building up reinforcing mat; applying belt-finish to road; the mixer skip; screeding the surface of pavement. Center, upper, excavator preparing subgrade; lower, baling empty cement sacks

on June 5 at 100.667. The village is to pay $2,000 annually on the principal of the bonds together with $2,500 interest on $50,000 for the first year, making a total first year payment of $4,500, the interest, of course, decreasing each year. There will be little, if any, maintenance cost on the main highway and none on that portion which will be constructed in conjunction with the state highway, as the state maintains its roads perpetually.

For some years South Nyack has been paying off sewer bonds at an annual rate of $2,000. The last of these sewer bonds was paid off in 1921, and therefore the average yearly payment on the village bond account in excess of the amount paid heretofore will be only $1,250 after the year 1923. The sum of $1,250 would increase the tax rate 6¼ points, or would increase taxes 61½ cents on each $1,000 of assessed valuation, providing it was decided to actually increase the taxes to take care of this bond account. This will probably not be necessary, as the expenses in maintaining the two roads which are to be paved has amounted to over $4,000 annually for the last four or five years. This amount released would take care of the new bond account, or if the tax rate were raised as stated above, this $4,000 would be released for the improvement of other streets.

On May 22, after advertising for bids, the road job was let to the Cornelius Vanderbilt Contracting Company, New Brighton, Staten Island, N. Y., for the sum of $40,092.50, plus extras. Work was begun about June 1. The contract called for the construction of a reinforced concrete pavement 7 inches thick, for a distance of 3,000 feet on South Broadway, and 445 feet on Cornelison Avenue, to a width of 24 feet, and for the construction of a pavement 18 feet wide and 7 inches thick for 1,315 feet on Piermont Avenue.

Preparing the Subgrade

The first work undertaken by the contractor was the excavation of the old bituminous macadam pavement on Cornelison Avenue and South Broadway, using a Keystone excavator. This work progressed very slowly because of the excessive rainfall during the latter part of June and July, which not only added to the weight of the material excavated, but caused considerable trouble with the miring of the wagons. The 10-ton Buffalo-Springfield road roller which was first used to break up the pavement with its scarifier attachment and which also drew the rooter plows for breaking up the pavement, came in very handy in hauling out some of the mired wagons. The excavator was also used to push out some of the wagons that were mired close to it. In the southerly section of South Broadway, about one block was very carefully underdrained, as this had always been a wet spot. Six-inch agricultural tile were laid about 2 feet below the grade of the finished subgrade, and covered with crushed stone. At street intersections concrete catch-basins have been constructed, connected by precast concrete butt joint pipe.

In the preparation of the subgrade a large number of boulders were removed, as well as many one-man stones. After the completion of the drain the subgrade was shaped by hand and rolled with the 10-ton roller.

Constructing the Pavement

The construction of the concrete pavement was handled in two strips. A strip 12 feet wide was built first from the corner of Piermont and Cornelison Avenues to the northern end of the job; the Blaw-Knox road forms were set well in advance of the Koehring 14-E steam-operated paver, and crushed stone and sand were dumped on the other section of the subgrade. This left ample space for the delivery of cement and for the operation of the laborers who used wheelbarrows in feeding the mixer.

The pavement is reinforced with ¼-inch Havemeyer factory-bent steel bars, at the rate of 65 pounds to 100 square feet of pavement. The reinforcing is bent so as to hold it at the proper elevation from the subgrade. The 12- by 12-foot reinforcing mats are assembled on the job. This form of reinforcement has been used with great success by the Delaware State Highway Department, well known for its concrete road construction.

Elastite, a pre-molded transverse expansion joint, is used about every 24 feet at right angles to the center line and perpendicular to the surface of the pavement. The joints are ½-inch in width, and are held by placing them against the wooden bulkhead and dropping the concrete in front of them. After the concrete has hardened

on both sides of the joints, it is pared off even with the surface of the pavement.

A 1:1½:3 mix of concrete is being used, the specifications calling for a medium dry mixture tending to produce a uniform, dense and impervious concrete. As soon as the section covering one reinforcing mat is completed, a heavy screed about 6 inches in width is used, operated by two men, for consolidating and contracting the concrete. After the concrete has been struck off with the screed and sufficient time has elapsed so that no displacement occurs, the pavement is rolled with a Macon roller, the property of the contractor. This roller is slightly over 6 feet in length, and 8 inches in diameter, and weighs a little more than 10 pounds per foot of length. The pavement is rolled continuously from side to side, each successive passage of the roller overlapping. After the rolling has been completed, the pavement is immediately belt-finished with an 8-inch belt. A 12-inch stroke is used, each stroke overlapping the previous one. The outside edges of the pavement are rounded to a ¼-inch radius with an edging tool. When the pavement had taken its initial set, it was surface marked with a street broom drawn from one side of the pavement to the other. After the final set had taken place, the concrete was covered with a thin layer of soil to retain the moisture.

The first section of the concrete pavement was opened to traffic about twenty days after it was laid. Thus a most dependable roadway replaced the old bituminous macadam, which was a series of pot-holes, making riding uncomfortable.

Bituminous Macadam Shoulders

On either side of the concrete pavement is a bituminous macadam strip varying from 2 to 4 feet in width, extending from the edge of the concrete road to the granite curb or paving brick gutter. The bituminous macadam shoulder is made up of a layer of crushed stone passing a 2¼-inch ring and retained on a 1¼-inch ring, spread to a finished depth of 3 inches for the wearing course, which is placed on a 6-inch base. The surface is bound with Tarvia X heated to a temperature of about 200 degrees and spread over the dry surface at the rate of 1½ gallons per square yard. On this, ¾-inch crushed stone without dust was spread to fill all the voids, and then rolled thoroughly firm. The shoulders were then swept free of stone not held by the binder, and not less than .06 of a gallon of Tarvia X was spread to the square yard, and covered with stone screenings rolled to a smooth surface. A sufficient amount of screenings was left on the surface to protect it while setting up. Following this, the road was opened to traffic, and after completion of the penetration, 0.3 of a gallon of Tarvia B to the square yard was spread over the shoulder. A blotter of clean, coarse sand was spread after the application of the final binder.

C. T. Allison, Engineer of Rockland County, N. Y., was the engineer for the village, and Cornelius Vanderbilt, Jr., was superintendent of the job for the contractor.

Did You Ever Stop to Think—

That the city that gets the publicity gets the business.

That the city that gets the advertising grows.

That advertising a city is a business, not child's play.

That people will go miles to get to a good live city to trade.

That your property will increase in value when the outside world knows your city is wide-awake.

That people from neighboring cities will come where there is something doing.

That the city which does not seek something better than it now has is going to lose out.

That now is the time your city and business need advertising more than ever before.

That if you don't get out and go after the trade, some neighboring city will.

That if they do, they will get the business you should get.

—*Norton Telegram.*

Developing the Beauty of a Small City

BOULEVARD CONSTRUCTION ON RESIDENTIAL STREET IN IOWA CITY, IOWA

Residence property situated on such a street is greatly increased in value as compared to property on streets paved from curb to curb

THE MUNICIPAL OUTDOOR THEATER IN IOWA CITY

An open-air theater in a city park requires almost no formal treatment. Practically every park affords a nook for the staging of a Greek play, a community frolic, or a pageant

Remarkable Progress Made on Chicago Plan

THE twelfth annual report for 1921 of the Chicago Plan Commission is a record of continued progress. Twelve major parts of the Plan of Chicago are now under way and in various stages of completion.

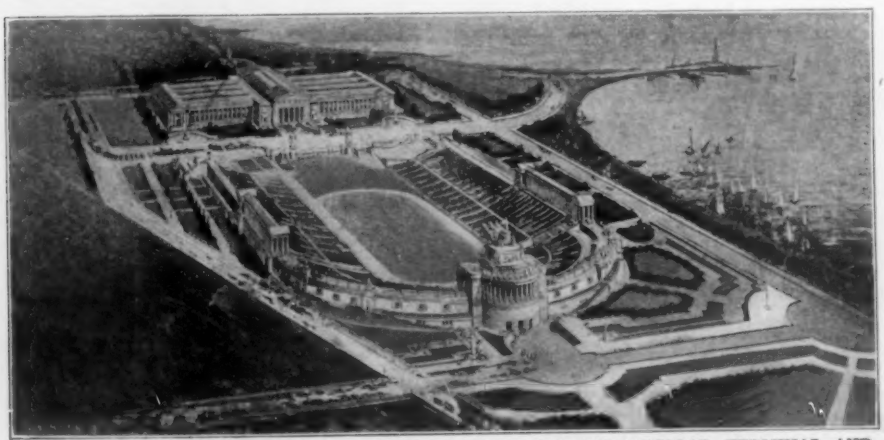
In the Plan, the foundation of the street circulatory system is a quadrangle of wide streets around the "loop" district, composed of Michigan Avenue on the east, Roosevelt Road on the south, Canal Street on the west, and South Water Street on the north. During 1921 the Michigan Avenue, Roosevelt Road, and Canal Street widenings made progress, and a large amount of necessary preliminary work in connection with the South Water Street project was accomplished.

The Plan of Chicago also proposes the creation of great traffic arteries extending as major streets north-and-south and east-and-west through the city from city limits to city limits. Three of these streets on the West Side—Western Avenue, Robey Street and Ashland Avenue, all north-and-south thoroughfares—progressed to the point of having court petitions for their opening, widening and extension filed in the courts during the last year. Construction was started on another, Ogden Avenue, which to-day is a great diagonal thoroughfare extending two-thirds across Chicago in a northeasterly direction from the western city limits to Union Park. Buildings are now being torn down to continue this street, 108 feet wide, for the three-mile distance from Union Park on the West Side to Lincoln Park at Lake Michigan on the North Side.

Court petitions were also filed on five other street widenings in the district just west of the loop, extending from the Chicago River west to Halsted Street, and from Harrison Street south to Roosevelt Road. In this area, Clinton, Desplaines, Jefferson, Polk and Taylor Streets are to be widened from 40 feet to 80 feet, in order to allow the district to develop into a first-class warehouse and commercial section.

The proposed harbors in Lake Calumet and along the shore of Lake Michigan at the Illinois-Indiana State Line, came a step nearer reality with the passage of an ordinance by the Chicago City Council providing for the creation of an industrial harbor in Lake Calumet, and the passage of legislation by the State Legislatures of Illinois and Indiana providing for a harbor commission to establish and operate the proposed "Illiana" transfer harbor at the state line.

The Forest Preserve Commissioners



FIELD MUSEUM, NOW COMPLETED, AND THE NEW ILLINOIS CENTRAL TERMINAL AND STADIUM NOW UNDER CONSTRUCTION, CHICAGO

acquired 3,487 acres during 1921, bringing the present total up to 21,516 acres; and a start was made upon the project of establishing a zoo in the forest preserves near Riverside, along the Desplaines River, ten or twelve miles west of Chicago. The County Board continued developing good roads, connecting Chicago with the preserves and with surrounding suburban villages, and connecting the various preserves.

Good progress was made in carrying on the lake front park development, and piling was driven in the shallow water along the shore of Lake Michigan to start the creation of what will ultimately be 1,138 acres of park lands, extending for five miles from Grant Park in the center of the city to Jackson Park on the south side. Necessary preliminaries in connection with the extension of Grand Boulevard northward by means of widening South Park Avenue to 198 feet were successfully conducted. In the Plan of Chicago it is proposed to establish a connection between the north and the south side boulevard and park systems by constructing a bridge across the mouth of the Chicago River, connecting Grant Park with the Municipal Pier, Lake Shore Drive and Lincoln Park.

The Illinois Central Railroad Company started initial technical work looking to the electrification of its facilities and the construction of its new depot fronting upon Grant Park at Roosevelt Road, the southern boundary of the traffic quadrangle encircling the heart of the city. The total estimated cost of this terminal improvement is $88,000,000. On Canal Street, the western boundary of the quadrangle, the Union Station group of roads is remodeling its facilities and erecting its new depot, at an estimated cost of $75,000,000.

Other miscellaneous activities carried forward last year by the Chicago Plan Commission, of which Charles H. Wacker is Chairman, included a study of the Pershing Road improvement, an important east-and-west thoroughfare four miles south of the loop; the suggestion of changes that will save the city of Chicago $2,000,000 in connection with the new Cicero Avenue bridge across the Sanitary Canal, six miles west of the loop; the Indiana Avenue widening, creating a new entrance into the loop from the south; the 22nd Street widening, an important east-and-west traffic artery two miles south of the loop; and other projects; as well as full cooperation with the Chicago Zoning Commission; the delivering of forty illustrated Chicago Plan lectures; and the distribution of more than a quarter-million pieces of Chicago Plan literature.

SKETCH FOR A CITY HALL TYPICAL OF THE NEWER TYPE OF FRENCH DEVELOPMENT, USED BY THE FRENCH IN REBUILDING THE DEVASTATED AREAS

Research and the Increased Functions of City Government

By Lent D. Upson

Director, Detroit Bureau of Governmental Research, Inc.

THE former mayor of one of America's largest cities was protesting certain proposed expenditures for public purposes. He said: "I belong to the period of economy in government, sanity in public expenditures, prudence in city adventures, and safety for the home, industry, and the future prosperity of the city." There was such a time in every great community, when city activities were few, operating expenses were low, and the public debt was small.

Such a time for Detroit may have been in 1874, when the city closed its first half-century as a corporation. In that year, the then city of 100,000 people collected a million dollars in taxes for the conduct of 33 public activities. There were no telephones, auto trucks, germ theories of disease, psychopathic clinics, aviation fields, sewage disposal plants, safety engineers, platoon schools, and streets with 12-inch foundations. The city government was a rather simple and inexpensive affair, doing pretty much as cities were doing a century, or perhaps even ten centuries, before.

But the last fifty years have told a different story. Scientific discoveries have made the modern city necessary and possible. To work in great factories, men must live in congested areas. This congestion of population has created new needs—traffic control, street widening, ample fire protection, additional police, better street lighting, and adequate water-supply. Higher standards of living have compelled the maintenance of parks, boulevards and museums, increased educational facilities, libraries, and concerts. Increasing humanitarianism has prompted the establishment of playgrounds, better prisons, care of the sick, and many activities unknown to citizens and officials of a generation ago. Scientific development has compelled the technical and expensive administration of old activities, particularly relating to public health, water-supply, and the disposal of wastes. Moreover, education no longer consists of the three R's.

The Great Cost of City Government

In consequence, the per capita cost of government in large cities has quadrupled and public debts have multiplied. City government, formerly simple and cheap, has necessarily grown technical and costly. The new city is a great business corporation, employing thousands of men and women, owning vast properties, equipment, and supplies; borrowing large sums on its credit; and engaging in extensive business for the benefit of the community. It stimulates commerce and industry; administers charity; cures the sick; protects the well; provides recreation; preserves life and property; and manages utilities that supply urgent public needs.

So the old French city of Detroit has changed. To-day its population is a million and it collects $40,000,000 a year in taxes to conduct 184 activities. Has the technique of its government and workable democracy kept pace with this tremendous growth? Obviously not—for this or any other community.

Effective democracy is not something of a day or of a generation. A civic conscience equal to modern civic problems must be developed within the schools and in the gradual appreciation by mankind that wealth and leadership owe a responsibility to the community, the paying of which is receipted in unmeasurable satisfaction.

Citizen Interest Essential

But technique in government in part is obtainable quickly, though not by individual citizen action. To keep in touch with the public servants responsible for each public activity, to know how each public dollar is obtained and spent, and to judge the effectiveness with which each technical task is performed, is more than any one citizen can undertake. Yet effective government cannot result unless the public can criticise from facts rather than from misinformation and will help officials change undesirable

TABLE SHOWING POPULATION, ASSESSED VALUATION TAX RATE
TAX LEVY, PER CAPITA TAX, NET DEBT AND PER CAPITA DEBT
from
1856 to 1921

Note : For the purpose of uniform comparison, the assessments and tax rates prior to 1876 have been recomputed on the basis of 100 % of the actual valuation, in place of the legal 30 % basis
Note : Prior to 1918 gross water debt was used.

Year	Population	Assessed Valuation	Tax Rate	Tax Levy	Per Capita Tax	Net Debt	Per Capita Debt
1921	942,373	$ 1,883,196,420	$ 21.67	$ 40,164,706	$ 42.62	$ 86,753,429	$ 93.06
1920	993,739	1,696,006,730	20.66	35,086,358	35.31	36,616,286	36.85
1919	950,000	1,374,532,330	18.55	25,501,273	26.84	26,874,708	28.29
1918	900,000	1,235,524,220	17.89	22,010,134	24.35	21,946,727	24.38
1917	820,778	1,174,517,900	13.80	16,218,778	19.67	20,104,791	24.61
1916	734,562	731,991,960	18.52	13,494,144	18.49	18,164,863	24.73
1915	678,746	554,382,950	23.64	13,106,187	19.31	16,442,939	24.24
1914	595,000	521,295,500	19.69	10,267,999	17.25	15,155,293	25.48
1913	567,920	486,763,120	20.29	9,877,183	17.31	9,802,281	17.26
1912	536,139	452,255,100	19.93	9,014,654	16.81	8,121,068	15.14
1911	499,030	402,652,810	18.15	7,311,161	14.65	8,255,555	16.55
1910	465,766	372,070,980	18.37	6,837,538	14.68	8,030,924	17.25
1909	440,412	360,269,910	18.07	6,329,536	14.37	7,778,188	17.66
1908	426,592	339,217,890	18.34	6,204,001	12.19	6,554,021	15.38
1907	404,782	335,997,380	15.46	4,996,786	12.34	6,181,972	15.30
1906	377,208	308,656,900	14.72	4,317,507	11.45	5,814,402	15.41
1905	369,805	287,268,670	14.70	4,051,363	10.97	5,221,266	14.12
1904	353,238	277,982,370	15.33	4,083,401	11.56	5,047,360	14.27
1903	339,550	271,868,920	16.57	4,270,393	12.59	4,993,330	14.71
1902	326,178	249,503,720	17.29	4,131,603	12.67	4,772,764	14.64
1901	313,886	247,248,500	15.70	3,777,425	12.03	4,612,090	14.70
1900	285,704	244,371,550	15.40	3,662,678	12.82	4,514,190	15.78
1899	275,000	216,971,000	16.33	3,514,092	12.78	4,346,401	15.80
1898	268,000	207,636,860	15.99	3,304,247	12.32	4,396,885	16.40
1897	260,000	206,825,870	17.68	3,640,878	14.00	4,539,723	17.46
1896	253,000	209,642,100	15.59	3,253,301	12.86	4,688,483	18.51
1895	245,000	209,586,330	15.70	3,281,449	13.40	4,801,796	19.60
1894	237,798	209,161,220	15.77	3,285,162	13.82	4,559,294	19.16
1893	228,000	199,679,210	15.16	3,015,818	13.23	3,277,434	14.36
1892	220,000	184,927,130	16.63	3,062,949	13.92	3,192,983	14.51
1891	213,000	176,450,310	16.78	2,934,555	13.77	2,368,800	11.12
1890	205,876	161,828,570	15.73	2,545,327	12.36	2,159,226	10.40
1889	196,000	156,503,790	14.29	2,236,464	11.46	1,990,024	10.21
1888	178,000	152,299,140	13.10	1,995,003	11.21	2,018,624	11.33
1887	164,000	142,407,880	12.04	1,714,431	10.46	1,853,015	11.30
1886	152,090	133,448,580	10.82	1,444,215	9.50	1,486,496	9.77
1885	142,000	116,249,945	10.77	1,252,343	8.82	1,462,262	10.30
1884	132,956	110,721,995	11.44	1,326,500	9.98	1,590,706	11.98
1883	128,000	105,910,924	10.88	1,199,244	9.36	1,798,232	14.05
1882	124,000	94,891,107	12.09	1,194,108	9.64	2,107,617	17.00
1881	120,000	87,629,695	11.36	995,448	8.29	2,264,958	18.86
1880	116,340	84,363,790	11.83	1,004,635	8.60	2,431,772	20.90
1879	113,000	83,198,040	10.90	907,428	8.03	2,221,582	19.68
1878	110,000	87,865,665	9.03	794,009	7.22	2,387,543	21.16
1877	107,000	93,709,375	9.49	880,990	8.23	2,430,500	22.72
1876	106,000	94,570,905	10.27	971,929	9.25	2,444,074	23.27
1875	103,000	92,482,100	11.94	1,104,515	10.72	2,510,614	24.38
1874	101,255	91,443,233	10.85	992,515	9.80	2,208,365	21.80
1873	95,000	90,305,483	9.70	876,696	9.22	1,778,647	18.72
1872	89,000	78,718,913	9.98	785,248	8.82	1,677,485	18.85
1871	84,000	74,509,303	12.32	918,207	10.93	1,640,128	19.52
1870	79,603	78,677,753	9.03	710,661	8.93	1,517,031	19.06
1869	75,000	76,456,510	9.34	713,098	9.51	1,366,796	18.22
1868	70,000	68,014,236	7.25	492,756	7.04	1,150,707	16.44
1867	65,000	77,686,140	6.06	470,839	7.24	1,129,324	17.37
1866	61,000	71,246,430	5.71	396,678	6.50	1,026,963	16.83
1865	57,000	66,816,100	5.44	363,400	6.37	1,070,632	18.78
1864	53,180	61,311,473	4.79	293,751	5.52	942,019	17.71
1863	51,000	56,739,913	4.32	245,057	4.81	937,160	18.37
1862	49,000	52,709,693	3.76	198,176	4.04	930,408	18.99
1861	47,000	50,294,196	3.79	192,923	4.11	947,000	20.14
1860	45,619	54,046,310	3.80	205,446	4.54	954,846	20.92
1859	44,800	52,555,033	3.94	207,179	4.63	912,929	20.39
1858	44,000	54,598,903	3.70	201,748	4.58	926,070	21.05
1857	43,300	49,154,893	3.41	167,880	3.88	785,880	18.16
1856	42,700	48,859,610	3.39	164,543	3.85	799,587	18.71

DETROIT'S GROWTH IN POPULATION AND MUNICIPAL UNDERTAKINGS

conditions. Intelligent citizen criticism and cooperation is the underlying theory upon which effective popular government is based.

Public officers and their employees are usually eager to perform their work well. They desire to plan ahead to meet future public needs, and are willing to adopt new methods of operation in their departments

if those methods will let them do their work better. When such improvements are not made, it is frequently because such officers are too busy with daily routine to discover and install changes in procedure which will mean greater economy and efficiency. Even if contemplated, changes of long-established methods are sometimes politically unacceptable and cannot be made without public support. Plans cannot be materialized without citizen interest.

Governmental research is an instrument for organizing and for applying that citizen interest. It means collecting the facts concerning city operations, with recommendations for improvement, and placing such facts and recommendations before officials; stimulating citizen concern in future city developments; and, finally, laying the facts of government before the public, when a definite end will be served by so doing.

The idea of organized citizen cooperation with public officials through fact-finding in place of fault-finding is not new. Conditions of the past ten years, however, have changed an emphasis from "lower taxes" to "getting the most for the money," in order that otherwise neglected requirements may be met.

But such cooperation must offer critical study and constructive planning in place of criticism. It involves a study of conditions, with suggestions for improvement, made to the official concerned and not to the press. In a carefully prepared report on any subject, questions of fact need not, and should not, be matters of difference. Deductions from facts, however, are easily matters of personal opinion. In reports dealing with important and technical subjects, the opportunity for such differences of opinion must be clearly recognized and every effort made to avoid categorical solutions of the questions raised. Rather, the effort should be made to indicate conditions and problems and suggest solutions which have proved successful in communities of similar size and conditions.

Intelligent Investigation Needed

Nor can such cooperation make pretension of being competent to cover all the technical lines of city endeavor. It can offer technical experience in certain lines, secure special advice in other lines, and frankly admit inability to help in others. And these "other lines" to which technical assistance cannot be brought are many. Experience has convinced officials generally that citizen research is helpful and should be used. Taxation has convinced thoughtful citizens generally that it pays to have unofficial representatives "sitting on the city hall steps." But neither officials nor citizens realize fully as yet the need of pure research in public administration.

Important functions in government are without advantages of real experimentation. Where is there a group with adequate finances and personnel which is contributing to the science of policing, crime prevention, court procedure, prosecution, street cleaning, snow removal, garbage disposal, etc.? The American Telephone and Telegraph Company is said to employ 2,500 persons working continuously seeking new devices that we may have better telephones. In contrast, consider the few persons and few dollars that are seeking in a coordinated way new devices that we may have better government. The sporadic efforts of present citizen agencies are largely engaged in applying the old rather than in discovering and publishing the new.

But let us consider a single city as an example—say Detroit. In less than 75 years the number of city activities has increased 868 per cent; population has increased 2,225 per cent; assessed wealth has increased 3,941 per cent, and the tax burden has increased 24,142 per cent. Seventy-five years is a long lifetime. Twenty years would take us back within the memory of most, and to the beginning of modern things. Within this time, since 1900, these increases have been: activities, 125 per cent; population, 250 per cent; assessed wealth, 660 per cent; and taxation, 1,000 per cent.

From such evidence, the present Mayor of Detroit is credited with the remark that "present city government must get less money and more brains." "More brains" cannot mean just individual ability, but rather correlated, intelligent effort to find better methods of conducting public business, and the making of these methods available to every city.

GROWTH OF MUNICIPAL ACTIVITIES IN DETROIT

Prior to 1824		Prior to 1824	
	Elections		Taxation
	Legislative		Treasurer
	Executive		Police Department
	Legal		Municipal Court

Prior to
1824 Fire Department
Elementary School
Street Grading
1832 Poor Relief
1834 Street Paving
1835 Sewers
Sewer Cleaning
Water-Supply
1841 School Census
1849 Controller
Street Lighting
1857 High School
1860 Prison
1863 Library
1864 Weight Inspectors
Licenses
1866 Sanitary Police
1867 Detectives
1869 Pound
Police Signals
1870 Parks
Public Buildings
1871 Harbor Police
1872 Permit Inspectors
1873 Engineering
1874 Evening Elementary School
1877 Health Superintendents
1880 Vital Statistics
Teachers College
Periodical Library
1881 Truancy Police
Criminal Identification
1882 Outdoor Relief
Hospital for Sick
Education of Incorrigibles
1884 Building Inspection
Fire Alarm Telegraph
Fire Pension
1886 Milk Inspection
Food Inspection
Fire Medical Service
Library Reading Room
1887 Garbage Collection
Rubbish Collection
1888 Water Meters
Meter Repairs
1890 Market Sheds
Zoo
1890 Ice Service
Free Medical Service
1891 Free School Books
1891 Gas Meter Inspection
Fire Boats
1892 Art Museum
Plumbers' Examination
Mounted Police
Reference Library
1893 Bathing-Beach
Plumbing Inspection
1894 City Attorney
Hand Street Cleaning
Chemical Laboratory
Bacteriological Laboratory
Kindergarten
1895 Electrical Inspection
Blind Library
1896 Snow Removal
1897 Band Concerts
1898 Nursing
Greenhouse
Education of Deaf
Branch Libraries
1899 Alley Cleaning
1901 School Children's Inspection
Smoke Inspection
1902 Permits for Sidewalks
Housing Inspection
1903 Meat Inspection
Aquarium
Conservatory
Police Medical Service
1904 Police Pension
Sewage Dump
Street Flushing
Tuberculosis Clinic
Evening High School
1905 Venereal Disease Clinic
Comfort Stations
1906 Forestry
Technical High School
1907 Motor Police
Tuberculosis Hospital
Baths
1908 Traffic Police
1908 Free Evening Lectures
Motion Picture Censorship
New Building Inspection
Sign Inspection
Wire Inspection
1909 Child Clinic
Contagious Disease Hospital
Education of Cripples
Education of Stammerers
School Transportation
Boiler Inspection
1910 Police Training School
Motor Bus
Elevator Inspection
Water High Pressure
1911 Civil Service
Property Identification
Education of the Anemic
Education of the Blind
Summer Elementary School
Summer High School
Summer Technical High School
Evening Technical School
1912 Detention Home
Refectories
Boating
Boulevard Lighting
1913 Police Record Bureau
Educational Research
1914 Serology Laboratory
Serology Inspection
Ferries
Charity Registration
Ambulance
Social Service
Hospital
Playgrounds
1914 School Gardens
Festivals
Oil Inspection
1915 Auto Recovery
Vice Squad
Park Sewage Treatment
Refrigeration Inspection
1916 Street Opening Bureau
Grade Separation Bureau
Junior College
School Purchases
Recreation Camps
1917 Summer Teachers College
Evening Teachers College
Parent Schools
Community Centers
Fire Prevention
1918 Purchasing Agent
City Planning
House Numbers
Complaint Bureau
Auto Repair
Motor Sweeper
Continuation School
Educational Cost Accounting
Testing Laboratory
Safety Bureau
Street Railway
1919 Probation Extension
Central Garage
Women Police
Medical College
Maternity Hospital
Tuberculosis Camp
Summer Junior College
Evening Junior College
School Architecture
1920 Psychological Clinic
Research Engineer
Prison Farm
Auto Dispatch
Nutrition
City Census

American Education Week, December 3-9

TO focus the attention of the American people on their educational needs, the week beginning December 3 has been set aside as American Education Week by a joint committee of the National Education Association and of the American Legion. This committee, in cooperation with the U. S. Bureau of Education, has issued a program for each day of the week under the following headings:

Sunday—For God and Country
Monday—American Citizenship Day
Tuesday—Patriotism Day
Wednesday—School and Teacher Day
Thursday—Illiteracy Day
Friday—Equality of Opportunity
Saturday—Physical Educational Day

The following suggestions are offered to chambers of commerce and other cooperating agencies:

1. Urge ministers of all denominations to preach upon the subject of education, Sunday, December 3, 1922.
2. Urge the Mayor to issue a proclamation setting aside this week as American Education Week and asking the people to cooperate.
3. Urge the newspapers to give all space possible to educational matters, articles, editorials, and news material.
4. Urge the merchants to use window displays appropriate for the occasion. Urge them to devote as much space as possible to matters of education in their newspaper advertisements.
5. Ask the moving-picture theaters to flash slides on the screen urging the people to visit the schools and study educational questions.
6. Have speakers at all public meetings held that week talk a few minutes on the necessity of education.
7. Cooperate with the educational officials and other patriotic, civic, and fraternal organizations.
8. Advertise American Education Week on letterheads and envelopes.

The complete program and other publicity aids may be secured from the National Education Association, 1201 Sixteenth Street, Washington, D. C.

The Development of Street Lighting in 1922

Report of Committee on Street Lighting, American Society for Municipal Improvements

A NEW 2,500-candle-power (25,000-lumen) gas-filled incandescent lamp of the 20-ampere series type has been developed and placed on the market. This new lamp is the most powerful light source that has ever been made available commercially for the lighting of streets. It is particularly adapted to business street lighting in those cities where it is desired to use especially high levels of lighting in important, congested districts. Previously the strongest illuminant available in the series-type gas-filled tungsten lamp was one of 1,500-candle-power (15,000-lumen). The 2,500-candle-power lamp makes it possible, therefore, to obtain nearly twice as much light from a single incandescent light source as has been obtained heretofore.

The old-style less efficient arcs have practically disappeared from use. They have been replaced in most cases by gas-filled incandescent tungsten series lamps. Incandescent lamps are now available in a complete range of sizes up to 2,500-candle-power, interchangeable on the same circuits and adapted for use in a wide variety of lanterns, globes, and refractors, for White Way, thoroughfare, boulevard, residence street, and highway lighting.

There is a very noticeable trend toward the use of larger lamp sizes. Engineers who have studied comparative costs and illuminating efficiencies are in agreement that 100 candle-power is the minimum lamp size that it is economical to use for street lighting. The lamps of less than 100 candle-power which are in use under the terms of some of the older street lighting contracts not only operate at a lower efficiency, but are uneconomical because too great a pro-

EXHIBIT OF EIGHTEEN LIGHTING STANDARDS AND GLOBES AT NELA PARK, CLEVELAND

EDITORIAL NOTE.—The six lighting standards shown on page 413 are typical of the exhibit at Nela Park. The upper row from left to right illustrates the Milwaukee harp one-piece Holophane glass refractor unit mounted on a Massey concrete post. The 400-candle-power lamp is mounted 15 feet high. The second unit is a Form 18 Novalux lantern with clear rippled glass panels and dome refractor made by the General Electric Company and mounted on a King cast iron standard. The 1500-candle-power lamp is mounted 14 feet high. The third is a Form 16 Novalux General Electric unit with a No. 37 Genco glass globe, mounted on an Elreco tubular steel combination railway and lighting standard and bracket. The 1,000-candle-power lamp is mounted 15 feet high. The lower row from left to right illustrates an octagonal Reflecto-Lux unit with clear ribbed glass panels, parabolic reflectors and Cutter-Westinghouse Arcadian cast iron standard. The 1,500-candle-power lamp is mounted 13 feet high. The second unit is a Form 16 Novalux globe and canopy on an Electric Railway Equipment Company tubular steel standard. The 1,500-candle-power lamp is set 13½ feet high. The third is a Form 23 Novalux lantern with Colonial alabaster glass panels and dome refractor on a Union Metal Mfg. Co. pressed steel standard. The 1,500-candle-power lamp is set 15 feet high.

portion of the annual street lighting cost to the city (sometimes as much as three-fourths of the total expenditure) is made up of fixed charges on the installation, and only a relatively small part of the expenditure goes for the production of light. Particularly where ornamental equipment is installed and where the investment cost is therefore fairly high per lamp, there is a growing conviction that the 250-candle-power lamp is the minimum economical size to be used in designing a new installation. However, very effective systems using lower candle-power lamps are being installed.

Ornamental street lighting equipment is rapidly becoming the standard, not only for business districts and parks, but also for thoroughfares and residential streets throughout the area of the city. While, of course, in many cities the overhead wooden-pole mast-arm or the center suspension is still being retained, this type of construction is coming to be regarded somewhat as a temporary or emergency measure which serves until arrangements can be made for suitable ornamental lighting.

It is noted that a very large number of new real estate subdivisions are being lighted by ornamental standards properly spaced before the lots are placed on sale. This is unquestionably a desirable practice, for not only are the property values increased by the absence of unsightly wooden pole constructions on the streets, but it is also true that the underground circuit construction, erection of posts, etc., can usually be handled much more economically before the streets have been paved, and before concrete drives have been put in, than afterwards.

One reason for the growing popularity of ornamental equipments for thoroughfare and residence streets has been the development of units which retain the efficiency characteristic of well-designed overhead pendent utilitarian units. Thus, in addition to the familiar opal globe, there are now available a number of carefully worked out refracting and reflecting units, varied in contour and appearance, suitable for both upright and bracket mounting, which give a materially increased utilization of light on the street surface.

Some New Installations

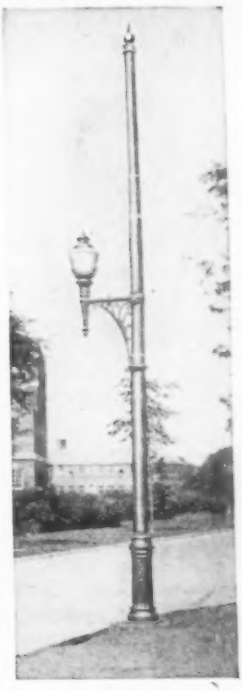
There have been many important extensions and improvements in the lighting of different cities during the past year, too many, in fact, to be individually discussed. Among these a notable installation utilizing a new equipment combining efficiency and good appearance is that in East Cleveland, Ohio, wherein a refractor lantern with a rippled enclosing globe is mounted on a 4½-foot bracket 16 feet above the street for the residential districts. On the thoroughfares, 400- to 1,000 candle-power lamps in similar units of larger size are used, with a mounting height of 20 feet and a bracket 6 feet in length. A novel feature of this installation is the use of 150-watt multiple lamps (200 candle-power) in the residence districts, supplied from underground circuits brought out along the side lot lines. By this means the lamps are furnished with current from the regular 115-volt house-lighting circuits without separate distribution. They are turned on and off by automatic switches located in each block.

The entire city of Kansas City, Mo., is being relighted by ornamental units containing 400- and 600-candle-power Mazda lamps in rippled diffusing globes. The installation is expected to total 10,000 units or more. Ornamental trolley pole brackets are used in the main business section. Ornamental posts evenly spaced are installed for all other streets.

In St. Paul, Minn., Summit Avenue, a well-kept residential boulevard, was lighted by a new system consisting of 400 ornamental refractor lantern standards with 400-candle-power incandescent lamps spaced approximately 120 feet apart.

Mandan, N. Dak., a city of 4,336 people, installed a new ornamental system of 447 standards—one lamp standard for every ten persons.

There has been growing interest in the subject of lighting of highways between cities during the past year, stimulated by a desire to increase the safety of night driving on these thoroughfares. One special equipment which has been developed for this purpose consists of a double set of parabolic reflectors which confine the light to the roadway. Favorable comments have been made upon a number of installations of these units mounted from 30 to 35 feet above the road and spaced from 300 to 500 feet apart. One result of the development



of artificial lighting of highways will undoubtedly be a further increase in night traffic passing through cities and villages, which in turn will require an increased provision for proper illumination of the thoroughfares leading through the municipalities.

Among the data on the relation of better lighting to accident and crime prevention which have been brought forward in the past year may be mentioned a survey discussed in a paper presented before the American Society for Municipal Improvements last November showing that 17.6 per cent of the street traffic accidents occurring at night were attributable to lack of illumination. According to the survey, nearly 600 fatalities are annually chargeable to this cause, and approximately $54,000,000 of the annual street accident loss. At the same time it was reported that the total expenditure for street lighting in the United States was not in excess of $50,000,000. It was further pointed out that the figure of 17.6 per cent was very conservative in evaluating the usefulness of illumination in preventing accidents, for, as a matter of fact, the streets of all the cities covered in the survey were illuminated at night by lighting of varying degrees of effectiveness. According to the survey referred to, in an individual city where the need for better street lighting is especially evident, the percentage of night accidents chargeable to the lack of light is likely to run as high as 50 per cent. On the other hand, in the case of those districts where fairly high levels of artificial street lighting are provided by so-called White Way systems, the percentage of night accidents chargeable to lack of illumination can be said to be fairly low.

It is pertinent to emphasize that while the expenditures for higher levels of artificial street illumination may be amply justified as an accident prevention measure, they can also easily be justified when the effect on the reduction of crime is taken into consideration. For example, a recent analysis of crimes occurring in the downtown district of Cleveland indicated that the installation of the White Way lighting system could be credited with a decrease of 41 per cent in the amount of crime on those particular streets as compared with the remainder of the city.

In the past there has been a wide diversity in practise as to the illumination of streets of the same character and importance in different municipalities. These variations have been due in part to differences in local opinion as to the requirements to be fulfilled, but in many cases the extent of available funds has been the important governing factor. With more evidence as to the real value of street lighting, not only from

STREET LIGHTING PRACTISE

Street Class	Lamp C.P. per Post	Mounting Height	Desirable Lamp Spacing Ft.	Arrangement of Lamps	Lamps C. P. per Foot Length of Street
100,000 or Larger Population					
Principal business	1,000-5,000	14-25	80-150	Parallel	20-100
Secondary business	1,000-2,500	14-18	80-125	Parallel	10-50
Principal thoroughfare	600-1,500	20-25	125-250	Parallel	3-10
Secondary thoroughfares, wholesale and manufacturing district	400-1,000	20-25	125-250	Staggered	2-5
Boulevards and parks	250-1,000	14-20	125-250	Parallel or one side	1-5
Residential	250-600	14-20	125-250	Staggered	1-4
Alleys, business section	250-600	16-20	125-250	One side	2-5
Outlying streets and alleys	100-250	16-20	200-400	One side	¼-1
20,000 to 100,000 Population					
Business	1,000-2,500	14-18	80-125	Parallel	10-50
Thoroughfares	400-1,000	20-25	125-250	Staggered	2-5
Boulevards and parks	250-1,000	14-20	125-250	Parallel or one side	1-5
Residential	250-600	14-20	125-250	Staggered	1-3
Outlying streets and alleys	100-250	15-20	200-400	One side	¼-1
5,000 to 20,000 Population					
Business	600-1,500	14-18	80-125	Parallel	5-30
Thoroughfares	400-1,000	20-25	125-250	Staggered or one side	2-5
Boulevards and parks	250-600	14-20	125-250	Parallel or one side	1-3
Residential	250-400	14-20	125-250	Staggered or one side	1-3
Outlying streets and alleys	100-250	16-20	200-400	One side	¼-1
5,000 or Smaller Population					
Business	250-600	12-16	80-125	Parallel or staggered	2-10
Thoroughfares	250-600	16-20	125-250	Staggered or one side	1-3
Residential	250	14-20	125-250	Staggered or one side	1-2
Alleys	100	16-20	200-400	One side	¼-½
Highways	250-400	25-35	300-600	One side	½-1

the standpoints of comfort, convenience, and commercial advantage, but also from the standpoint of accident and crime prevention, there appears to be a more definite crystallization of opinion as to the desirable practise for the different classes of streets. The table on page 414 has been assembled to indicate the desirable range of practise under present conditions.

The committee recognizes that the 100-candle-power lamps have a place in residential sections, on narrow streets, curbed parkways, in parks, in alleys and certain outlying streets.

Character of Construction

Varying types of ornamental equipment are suited for the different classes of streets. For business streets the upright column with a single lamp is most common, though ornamental trolley pole brackets are often used. For intensive or White Way lighting with 3,600- to 5,000-candle-power per standard, two-light or three-light units have been adopted. For thoroughfares, boulevards, parks, and residential streets, both ornamental bracket standards and upright standards are common. In some instances ornamental brackets are attached to trolley poles or to other poles already in place. The preference is for underground wiring, though some ornamental poles can be successfully adapted to use overhead wiring. For outlying districts, alleys, and highways, underground wiring is seldom practical.

The experience of a number of municipalities that have improved their lighting throughout the city to bring it into line with modern standards indicates that this can be done effectively at the modest cost of from $1.50 to $2.50 annually per capita. In most cases the latter figure makes possible the installation of an ornamental system throughout the city. In a comprehensive survey recently reported, the highest expenditure in any city was $4.81 per capita per year. It should be pointed out, however, that comparisons of cost on a per capita basis are likely to be misleading, since there are such great variations in miles of paved street per thousand of population. Street length as a basis of computation introduces other variables depending upon the arrangements of intersections, width of streets, amount of foliage, character of paving and local costs, but the following tabulation is given as indicating the range of cost of carefully designed ornamental street lighting for different classes of streets, assuming that there are no extreme conditions affecting the cost.

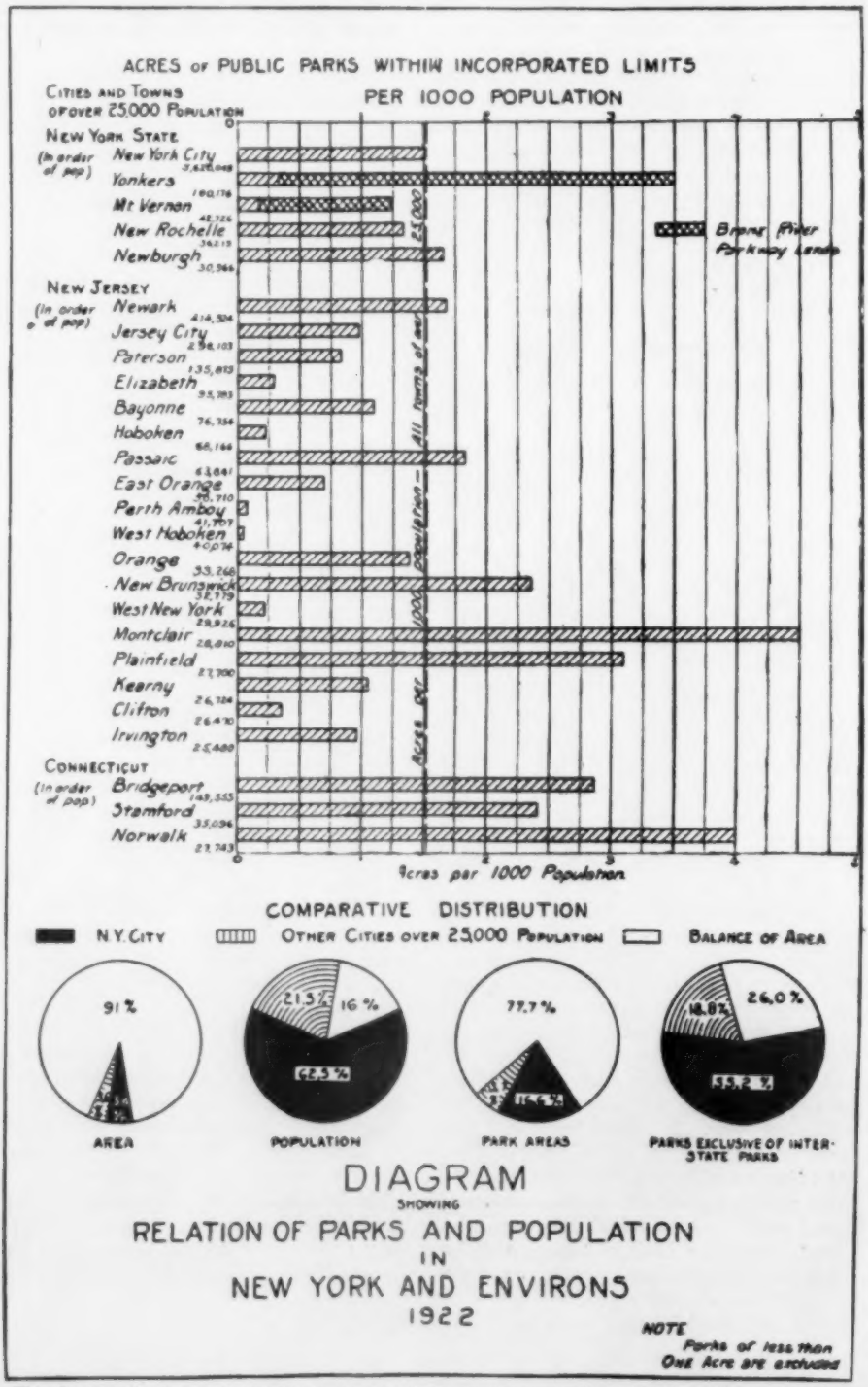
	Annual Cost per Foot Length of Street
Business district White Way	$1.00-$4.00
Thoroughfares and boulevards	0.30- 1.20
Residential streets	0.20- 0.80

The crowded condition of city budgets has made it difficult for many municipalities to provide the necessary improvements in street lighting. In recognition of this difficulty some states already have acts permitting improved street lighting to be charged back to property holders, as is done in the case of paving and other necessary street improvements. Under this plan the contract for the installation and operation of the lighting can still be handled by the municipality itself, and this is very desirable to insure continuance of good service.

For years it was almost the universal practise to have the contract charges for street lighting based on a fixed charge per lamp per year, which included allowance for carrying charges on the investment as well as the cost of operation and maintenance. However, in the case of White Way lighting, on account of the special investment necessary, the equipment has often been installed by the municipality and a separate contract entered into for the operation and maintenance of the system. This same practise appears to be growing in favor in the case of municipalities where ornamental installations are being made for the entire city. Proponents of this plan point out that the municipality, under this arrangement, has an unlimited choice in the selection of the type and design of standards and lamp equipments installed, and at the same time is in a position to secure favorable rates for maintenance and operation of the system, since the contractor is not faced with the necessity of amortizing the investment during a relatively short contract period.

This street lighting report was submitted by C. W. Koiner, City Manager, Pasadena, Calif.; Earl A. Anderson, Illuminating Engineer, National Lamp Works, Cleveland, Ohio, and Ralph Toensfeldt, Engineer, Division of Lighting, St. Louis, Mo.

How Much Park Space Has Your City?



DIAGRAM

SHOWING

RELATION OF PARKS AND POPULATION

IN

NEW YORK AND ENVIRONS

1922

NOTE

Parks of less than One Acre are excluded

This diagram showing park statistics is one of a large number prepared for the Committee on the Plan of New York and Its Environs, through the Physical Survey, under the direction of Nelson P. Lewis

Forward Steps in Municipal Affairs

Recreation Departments

A Citizen's Gift to the Children of His City

GRAND JUNCTION, COLO.—Cooperation between a public-spirited merchant, W. J. Moyer, with City Manager George Garrett and the city councilmen, has given to Grand Junction a municipal swimming pool that has filled a long-felt need through the hot summer just ended.

Mr. Moyer, who is childless, desired to give to the children of the city a gift that would show his interest in them, and asked his nephew, William Weiser, President of the Grand Valley National Bank, to name the form of the gift. The nephew, remembering a boyhood spent in a community where the only swimming possible was in irrigating ditches, suggested a concrete swimming pool, and Mr. Moyer accordingly appropriated funds and secured designs for a pool that is modern in every respect.

The pool itself is of reinforced concrete, and its value to the community can be judged from its thoroughly adequate dimensions. The main pool is 100 by 75 feet. It varies in depth from 7½ feet to 1½ feet. Adjoining the main pool is a wading pool 12 by 75 feet, and beyond it is a sand-pit of the same size. Two pergolas flank the sides of the wading pool and sand-pit, for the convenience of mothers or nurses who have their charges at the pool. These pergolas are 50 by 12 feet and they have been provided with seats for the comfort of the onlookers. Two shower rooms, 10 by 12 feet, are provided, and there are 60 dressing-rooms, 3 by 5 feet 4 inches. The pool has proved to be so popular that the capacity of the dressing-rooms has been taxed on many days this summer.

The pool and its auxiliary features were presented to the city by Mr. and Mrs. Moyer with the proviso that on at least two days of each week they are to be free to children under 16. An ordinance was passed by the City Council, and later on the charter will be so amended as to provide for making this a permanent feature.

An administration building of frame and stucco contains rest rooms for women and men, offices where tickets, bathing-suits and towels are obtained, and a large refreshment room where ice cream and soft drinks are served. The city refused to give out a concession for refreshment privileges, preferring to use whatever profit there might

GRAND JUNCTION'S NEW MUNICIPAL SWIMMING POOL, THE GIFT OF A PUBLIC-SPIRITED CITIZEN

EN ROUTE TO OAKLAND'S MUNICIPAL RECREATION CAMP
A party pausing at one of the stopping-places on the 150-mile trip

be for extension and maintenance of the pool and buildings. A substantial profit has been realized already, and it is the hope that, even allowing for the heavy patronage on the days when the pool is free to children, there will be a profit that will permit of added equipment as it is needed.

The total cost of the pool was about $30,000, part of this sum being given by Mr. and Mrs. Moyer and the rest taken from the city park funds. The pool was dedicated on June 8, with one of the largest crowds ever gathered together in the city present at the exercises, which were also attended by Governor Shoup and other notables of the state.

MERLE McCLINTOCK.

Oakland's Municipal Recreation Camp

OAKLAND, CALIF.—The Oakland municipal recreation camp may become the model for the nation as well as for other municipalities, according to Stephen H. Mather, Director of National Parks, who was a visitor to this forest camp recently. It is situated in the Sierra Nevada Mountains, in Stanislaus County, on the Tuolumne River, 152 miles from the city of Oakland and 3,500 feet above sea-level.

The camp is for the benefit of permanent residents of Oakland or those who pay taxes on Oakland property. It is divided into three sections: one for the children, where boy and girl groups alternate in periods of two weeks each; one for adults, where families may remain for any length of time; and another section for automobile parties furnishing their own transportation and equipment.

The board, including tent accommodations, is $6 per week for grown-ups and $5 for children under twelve. The food is prepared by a competent chef and is well cooked and wholesome. Each person gives an hour's service a day toward the camp duties, the boys bringing in the supply of wood, and the girls taking turns at washing the dishes. The tents are provided with clean individual cots and mattresses, but the campers furnish their own blankets. The sanitary facilities are according to specifications of the U. S. Forest Service.

The fishing is fine, and there are several bathing pools of various depths. A number of interesting side trips can be taken from the main camp. Among them is a trip of ten miles to the Hetch Hetchy Valley, where development work is in progress on the water project of the Hetch Hetchy reservoir for the city of San Francisco. This,

when completed, will give a water-supply for 4,000,000 people.

The site for the camp was given to the Recreation Department of Oakland by the United States Forest Service. The camp is operated on a cost basis. During 1922, about 3,200 persons were accommodated during the 17 weeks the camp was in progress.

JAY B. NASH,
Superintendent of Recreation.

Mayors

A Community Building in a South Dakota City

MITCHELL, S. DAK.—When the new Corn Palace was planned for the city of Mitchell, the builders dedicated it not only to the annual exhibition of grain and corn, but also to the needs of the community. It is reputed to be one of the finest municipal auditoriums in any small city in the United States.

The building has a seating capacity of from 4,000 to 4,500, a large stage, a floor suitable for dancing, a balcony on three sides, and places for booths. It was opened for the first time during Corn Palace Week in September, 1921. Since then it has served various community interests. Sousa's Band played on its stage in November; Governor McMaster spoke to a crowded house on Armistice Day; a week of community activity kept the Corn Palace open day and evening during the Christmas holidays; Governor Allen of Kansas spoke there in April. The largest gathering in the new building was probably during the first Mitchell Automobile Show, April 20, 21 and 22.

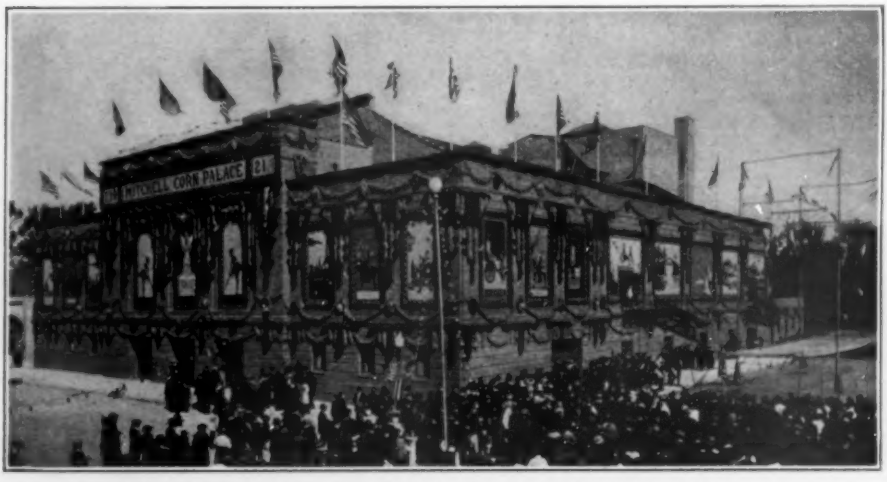
The building is of brick, each side carrying set-in panels in which decorations are placed. The decorative scheme shown in the accompanying photograph is that of disarmament. The central panel shows the dome of the Capitol at Washington. On either side, Miss America is seen laying down the sword; and all the other panels show the nations of the earth moving towards Washington to join in the disarmament program.

E. V. BOBB,
Mayor.

City Managers

City Purchases "Success Talks" for Employees

SALINA, KANS.—An interesting innovation in building up a cooperative spirit among municipal employees has been tried out in Salina. The city has purchased from Stevens-Davis and Company of Chicago a



MITCHELL'S CORN PALACE, A NOVEL MUNICIPAL BUILDING AND AUDITORIUM

WORKING FOR BETTER SCHOOLS

A few of the children who helped put across the Los Angeles $17,400,000 bond issue

series of "Success Talks" which have been used extensively by the larger corporations to promote a cordial spirit of cooperation among their employee groups. For the same reason, the city has introduced these "Success Talks. They include such statements as the following:

"There is enough to know about any work there is to do to make the one who does that work an expert in his line. To be expert means to do the work in hand the very best that it can be done."

We feel that we are getting as a result splendid service and cooperation from our employees. We purchase these "Success Talks" by the year, the cost being very moderate. A copy of each week's talk is sent to each of the sixty-two municipal employees. Each month there is a rousing good meeting at which each of the talks is taken up and discussed from the standpoint of the city. At these municipal meetings prominent business men of Salina address the city employees. Their comments, and the meetings in general, seem to be much appreciated.

W. A. LAYTON,
City Manager.

Departments of Education

$17,400,000 for Los Angeles Schools

LOS ANGELES, CALIF.—A landslide vote in favor of the Los Angeles school bond issue of $17,400,000 was cast on June 6, 1922. Following a spirited, and in some respects a spectacular, city-wide campaign of appeal and education in which thousands of school children took part, an overwhelming majority of 15 to 1 in favor of greater school facilities was registered.

The school bond issue enables the school authorities to construct four new high schools and four new junior schools, make extensive additions to 25 senior and junior high schools, build or make additions to 97 elementary schools, and purchase a large number of school sites. The Board of Education plans to spend approximately $5,000,000 of the combined elementary and high school issues within a year after the

initial bonds are sold, and $5,000,000 a year thereafter.

The bond issue of $17,400,000 was determined upon after an exhaustive survey of the entire school district of the city. The survey showed an astounding condition of such rapid growth in the school population that virtually all schools were required to conduct half-day sessions and resort to various other makeshifts, such as utilizing corridors, offices and storerooms for class purposes to accommodate the increasing thousands of school boys and girls.

The last tabulation of enrollment in the city's schools indicated a registration in excess of 139,000, an increase of 20,000 annually for the past three years. In many localities it has been necessary to hold school in tents and sheds of a purely temporary character.

In the recent bond campaign each school neighborhood had its own active group of parents, teachers and students at work. Thousands of automobiles were donated for the transportation of voters to the polls.

(MRS.) SUSAN M. DORSEY,
Superintendent of Schools.

A TRAFFIC SIGNAL THAT EVEN THE MOST CARELESS MOTORIST CANNOT FAIL TO SEE

HELPING THE STRANGER TO FIND HIS WAY IN DETROIT

Police Departments

Flashing Traffic Signal and Information Booth Attract Attention

DETROIT, MICH.—The traffic signal shown in the illustration is very effective, for no motorist can run into it without seeing it—which occasionally happens with some of the "silent policemen." It consists of a black and white iron post about 10 feet high set in a concrete base and surmounted by a red glass globe. Within is a brilliant electric bulb, and above is a wind-gage, connected by means of a small shaft to a device within the globe which keeps two broad, dark-colored blades traveling around the electric bulb. Thus, whenever the wind blows, which is nearly all the time, the light is made to flash. As a result, it is very conspicuous and can be seen for a long distance.

This particular signal is located at the intersection of Farmer Street and Grand River Avenue.

For the convenience of visitors to the city, the Police Department of Detroit has erected an information booth at the center of the city. This is in charge of officers who are specially trained to be able to answer almost any question one may ask about the city. City directories, telephone directories, maps, etc., are on hand, so that if a question is asked which the officer is unable to answer, he can soon look it up and supply the information.

It has been found that this booth is not only a great convenience to strangers, but also greatly simplifies the work of the police, because people ask their questions at the booth instead of going out into the middle of the street and distracting the attention of a traffic officer.

HARRY H. JACKSON,
Inspector, Traffic Division.

City Clerks

Warsaw Spruces Up

WARSAW, IND.—What sixteen months ago was one of the worst-looking places around Warsaw is to-day a small park of approximately three acres which is a credit to the city. This was brought about by making a fill of from six inches to two feet on some low swamp ground around the bank of Center Lake. The new park not only has a very fine lawn, but also one of the best swimming beaches in the neighborhood, all within three blocks of the court house and therefore accessible to all the citizens. When work on this improvement was started, many of the citizens were greatly opposed to what they thought was a waste of the taxpayers' money, but the change from what was to what is to-day, was so worth while that as the work progressed the opposition diminished. A look at the improvement itself made evident its value to the citizens.

A city dumping-ground that had for some time been a nuisance has also been cleaned up and filled in to make a playground, and to prevent a recurrence of the conditions surrounding the old dump a new ordinance has been enacted which insures the keeping of the playground and the new dump in a sanitary condition. Credit for the changes made belongs to Alderman Walter Kintzel, whose energy and enthusiasm resulted in the authorization to do the work. As sometimes befalls proposers, the task of carrying out the plan was laid upon Alderman Kintzel, and he was told to go ahead and to use his best judgment. The results have indicated his faith in the possibility of changing eyesores into assets.

R. O. NUSBAUM,
City Clerk.

Finance Departments

Fitchburg Also Gets the Facts to the Public

FITCHBURG, MASS.—Fitchburg's city officials were much interested in the item in the September issue of THE AMERICAN CITY entitled "Getting the Facts to the Public," in which Mr. Steffens of Detroit, Mich., gave the experience of that city in informing the citizens of the doings of the municipal government.

For a long time Fitchburg has been using much the same method. We have viewed our city government as a board of managers or directors, like the directors of a corporation, and the taxpayers as stockholders who furnish the funds with which to do business, and believing that it is just that they should be kept in touch with the distribution of their funds, we have made every effort to keep them posted. Every month we print a monthly balance sheet, and through the cooperation of our daily paper present to the public each month a statement of the funds in the treasury and the purposes for which these funds have been expended. The sheet also serves as a check on all the city departments, to the extent that as soon as it appears, each of the departments obtains a copy and compares its own total with the total in the balance sheet, so that if any differences are noted they may be investigated immediately and the errors rectified.

Many other cities in Massachusetts publish similar reports, and this publicity of expenditures appears to be really appreciated by the citizens.

F. D. PAGE,
City Auditor.

The Removal of Taste and Odors by Aeration, Filtration and Other Processes---Part II

By Norman J. Howard

Bacteriologist in Charge, Filtration Laboratories, Toronto, Ont.

Taste and Odors Following Chlorination of Water

THE cause of taste following the chlorination of water is not definitely established, yet certain controlling conditions have been observed at Milwaukee and elsewhere, and abatement of the attributed cause resulted in the elimination of taste. In treated waters two types of taste occur —chlorine, and a distinct medicinal taste. The latter is sometimes described as resembling the taste of iodoform. Each taste generally occurs separately, and the writer has no record where chlorine and iodoform taste have been reported as being present at the same time. Quite often excess chlorine smells and does not taste, but the iodoform compound both tastes and smells, particularly when the water temperature is above 50 degrees F. The chlorinous taste is, as the word implies, due to excess chlorine, while the iodoform taste is said to be due to the presence of chloro-phenols. Extensive observations made by the writer have not convinced him that this is the sole cause, although it is admitted that the presence of phenol in small quantities does seemingly combine with chlorine and form chemical compounds which produce most offensive tastes and odors. Laboratory work carried out during the past few months has produced some surprising, and at times puzzling, results. It has been generally assumed that the presence of organic matter is essential for the production of iodoform taste in chlorinated water. In distilled water treated with taste-producing doses of chlorine and phenol, the characteristic iodoform taste is not produced, but a pronounced chlorinous taste results. If this same water is passed through a rapid sand filter, the organic matter or some unknown substance is taken up by the water and produces a most offensive taste and odor. Inversely, slow and filtered water after treatment with chlorine and phenol develops a taste which is, however, greatly lessened by passage through the same filter.

The greatest objection raised against the chlorination of water has been the production of taste and odors in certain supplies. This condition has at times been used as an argument against the installation of sterilizing plants, and it must be admitted that where these objectionable conditions are of periodic occurrence, they cause much unrest and constitute a real nuisance. The writer is of opinion that in most cases taste could be overcome if authorities would make a thorough investigation and definitely establish a cause. The city of Toronto has just authorized a year's research work on this important subject, and preliminary observations carried out are most encouraging.

When in Europe last summer, the writer saw records indicating that the presence of organic matter and phenol was not necessary for the production of the iodoform taste. The case in point has reference to a deep well water of great organic purity and free of phenols, which had received some slight surface water pollution and consequently was chlorinated. The well formed part of a supply for a large community, and after treatment with a small dose of chlorine, a pronounced iodoform taste resulted. One is therefore forced to the opinion that while organic matter and phenols are contributory to taste production, in certain cases there must be other causes which act in a similar taste-producing manner. In support of this, it should

be pointed out that at Toronto, where industrial wastes are discharged into the city sewers all the year round, and extensive tests are daily made on the raw water, the iodoform taste occurs largely in the early spring and late fall, and if phenol were the only cause of this taste, objectionable conditions would prevail throughout the year. The obvious answer is that at certain low-temperature periods some other organic or vegetable matter combines with chlorine or phenol, or even both, producing the conditions complained of. It is also possible that if phenol is the direct cause, increased biological activity in the warm summer months assists in preventing the formation of obnoxious chemical compounds.

Before discussing the iodoform taste in detail, it would be well to dwell briefly upon the chlorinous taste or odor, which not infrequently occurs under two conditions: first, in water comparatively free from pollution; and, second, in water where too great a quantity of chlorine has been applied. The elimination of the first-named condition is practically impossible, except by aeration, which is neither practical nor necessary. Water containing a small excess of chlorine, particularly when the temperature is low, has a slight odor when first drawn from the tap, but this rapidly disappears upon exposure to the air. In waters containing chlorine in excess of the amount necessary for sterilization purposes, both taste and odor exist. Tea made from such water will have a most objectionable taste, due to the action of the chlorine on the extractive matter present. As is the case when phenol is present, it is possible that some similar chemical compound is formed by the combination of chlorine and tannin.

Chlorine Absorption Standards

The chlorine absorption method as suggested by Wolman is very practical, and as several observers have reported the elimination of taste since using this system, it would seem well worthy of adoption. In Toronto the establishment of color standards was found to greatly reduce the chlorinous taste. The dosage necessary for sterilization purposes was worked out, and the blue color produced by definite doses of chlorine in the presence of starch and iodide was matched artificially. By making up color standards numbered 1 to 5, and establishing the fact that colors 3 to 5 were sufficient to sterilize the water under varying conditions, chlorine operators were instructed to keep their dosage within these color ranges.

This is not put forward as a solution for taste elimination. Since its adoption in Toronto, however, the number of complaints have been greatly lessened. The colors do not represent any definite quantity of applied chlorine, but, generally speaking, colors 3 to 5 represent approximately an application of .175 to .225 parts per million of chlorine with a water temperature ranging between 33° and 45° F. As the water warms, chlorine is absorbed more rapidly, and with a temperature of 68° F. it may be necessary to apply .375 parts of chlorine to maintain a color of 3 to 4. The organic content and temperature of the water will be found to practically control the rate of chlorine absorption. The formula for preparing the color standards is as follows:

Standard No.	Distilled Water	.01 Per Cent Brilliant Mill Green S.	.01 Per Cent Cardinal Red J.
1.....	150 c.c.	4 c.c.	0.866 c.c.
2.....	150 c.c.	5 c.c.	1.053 c.c.
3.....	150 c.c.	6 c.c.	1.10 c.c.
4.....	150 c.c.	7 c.c.	1.15 c.c.
5.....	150 c.c.	8 c.c.	1.25 c.c.

The standards should be made up weekly, placed in china cups and protected from the light. In all taste-producing conditions there must be controlling factors, and quite often it is difficult to avoid taste without taking chances on the final quality of treated water, particularly if it is unfiltered.

Preventing and Eliminating Iodoform Taste

By far the most serious taste to overcome is the iodoform one, because when the taste has once developed, its elimination is difficult. Generally speaking, water which tastes after treatment with chlorine improves on storage, but when the iodoform taste is present, it steadily deteriorates, and should it warm up, a chemical odor can be detected. In connection with the production of this taste, Houston's remarks as recorded in his 15th Annual Report are of considerable interest. He states:

"Experience has indicated that the iodoform taste can practically always be removed or prevented, either by increasing the dose of chlorine

sufficiently, or by adding potassium permanganates as well as chlorine to the water. In the former event, the excess of chlorine may have to be removed by dechlorination (using a solution of sulphurous acid gas, sodium sulphite, bisulphite, or thiosulphate) and in the latter case it is desirable to remove the precipitate of manganese oxide. The permanganate can be used before, at the same time as, or after, the addition of chlorine, that is, it can be used either to prevent the occurrence of the iodoform taste, or to remove it after it has already developed. Similarly, the whole of the superdose of chlorine may be added to the water at one time, or more chlorine may be added to overcome an iodoform taste which has already occurred in a chlorinated water. Enormous doses of chlorine (one in 11,000) may be added to water and the taste of chlorine entirely removed by the use of a suitable anti-chlor (dechlorination). When, however, the chlorinated water has developed the iodoform taste, dechlorination is powerless to remove it."

One of the most important observations made was that when dealing with filtered water, chlorine or permanganate could be used before, or after, filtration, or chlorine added before, and the permanganate after, filtration, but the addition of permanganate before and the chlorine after invariably produced an iodoform taste. The experiments as conducted by Houston usually involved several hours' contact, and in this country this condition is difficult, the water quite often passing into supply almost immediately after treatment. This, of course, does not apply to cities where the supply emanates from impounding reservoirs or where the works are located outside the city limits. The cause of the iodoform taste has been the subject of extensive research, and the city of Milwaukee is credited with being the first to demonstrate the relationship of phenols and chlorine to the production of taste.

During the last few years in Toronto, extensive investigations have been made upon taste-producing conditions. Numerous hypotheses have been advanced from time to time, and have included the microscopic content, the biological content, the formation of chloramines, and latterly the formation of chloro-phenolic compounds. The connection between the microscopic and biological content and iodoform taste has not been demonstrated, although when taste does develop, there is often a pronounced increase in both conditions in the raw water. Similarly, abnormally high free ammonia has periodically occurred at these times, and the formation of chloramines has been suggested. This latter compound of ammonia and chlorine does actually produce an objectionable taste and smell when occurring under pollution conditions. Curiously enough, when chloramine is used as a sterilizing reagent, no taste occurs.

Assuming that the excess chlorine treatment could be successfully applied to most supplies where tastes and odors occur, the problem narrows down to one involving the determination of the amount of chlorine necessary, and the subsequent removal of excess chlorine according to the Toronto experiments. Where aeration is possible, dechlorination would in most cases be unnecessary. This would, of course, be dependent upon the amount of chlorine originally applied and absorbed. Radical changes such as excess chlorine treatment involves will necessarily alter certain operating conditions, chief among which must be regarded the filtration and sterilization processes. In connection with these, excess chlorine taste and odor could be largely removed, without affecting the quality of the effluent, by chlorination prior to filtration. Filters of any kind have remarkable chlorine absorption powers, due in part to their retention of organic matter. For various reasons engineers do not favor this practise, but the writer sees no reason, particularly where mechanical plants are involved, why chlorine could not be applied to the water after sedimentation and prior to its passage through the filters. This of course would apply only at times when the excess chlorine system was in use for relieving taste conditions.

At Toronto, chlorination prior to filtration has been found to work efficiently and give satisfactory results. No attempt has yet been made to use excess chlorine treatment. This matter is at present under consideration and will in all probability be tried out this summer. Laboratory experiments have, however, demonstrated that filtration does decrease the iodoform taste, and if the application of chlorine be so controlled that this taste is not allowed to develop, there should be no reason why the chlorinous taste could not be greatly removed by application before filtration. The removal of excess chlorine by chemical reagents depends entirely upon local conditions. If the location of the plant, the general engineering considerations, and the quality of the water are favorable, there is no reason why this system could not be undertaken, always bearing in mind that

technical supervision is essential. The success of the treatments has been demonstrated in England by Houston.

Recently the removal of the iodoform taste by excess lime has been tried in Toronto, and while the experiments are not yet sufficiently advanced, preliminary observations are not very favorable. It was found, however, that the taste was reduced, but not eliminated, when using large quantities of lime. The combination of the characteristic taste produced by excess lime in water, together with the iodoform taste, rather masked the true taste, and three separate observers were able to detect the iodoform taste after a 20-hour contact period. When water treated with chlorine, phenol and lime and having a doubtful taste was passed through a rapid sand filter, a pronounced iodoform taste resulted, thus confirming the opinion previously expressed, that lime only masked the iodoform taste. Taste occurring in the treated water at temperature of 60 degrees was less pronounced than at 45 degrees F.

The experiments conducted by the Milwaukee Sewerage Commission under Hatton and Copeland and described in the 7th Annual Report of the Commission are of particular interest. Ammonia condensation liquor was found to contain as much as .144 per cent of phenol (carbolic acid). In the experiments made, ammonia condensation liquor containing .078 per cent of phenol and other taste-producing compounds showed that one part of the liquor produced a taste in 40,000 parts of chlorinated Lake Michigan water. The ammonia condensation liquor was added to sewerage entering the aeration tank in quantities ranging between 0.8 and 9.1 per cent of the sewage flow. No taste of consequence was discovered in the effluent except on one or two occasions. At such times the taste was so slight that, when the effluent was diluted with lake water, no taste could be noticed in the diluted sanple. Conclusions arrived at were, that under warm weather conditions the activated sludge process of sewage purification will remove the carbolic acid taste in sewage which contained ammonia condensation liquor equal to 2 per cent of the sewage flow. For that reason it is concluded that the sewage disposal plant should protect the water-supply from taste produced by ammonia condensation liquors discharged into the sewers. The absence of taste in many cities during the summer months might also be linked up with this condition, as where industrial wastes are discharged into sewerage systems, marked seasonal biological activity occurs, which may have much to do with taste prevention.

Rudolph Thompson, Assistant Chemist of the Toronto Filtration Laboratory, has been closely associated with the writer in the whole of the investigations recently made in connection with the occurrence of taste in chlorinated water. In conclusion, the writer is strongly of opinion that if industrial wastes are the real cause of taste occurring in chlorinated water, the best and surest remedy would be the prevention of stream pollution. In some states and provinces laws are in existence which, if enforced, would put an end to the discharge of obnoxious wastes into streams from which public water-supplies are drawn. It seems only just that the onus should be placed upon the manufacturers, and it is hoped that if the existing laws cannot be enforced, future provision will be made whereby the burden of preventing stream pollution will be placed upon those directly responsible.

Acknowledgment:—From a paper read at the annual convention of the American Water Works Association, May, 1922.

Save the Useful and Ornamental Roadside Trees

In the cleaning up of a roadside, better save the young trees. Even if we save too many, they are producing useful wood and the surplus can be cut any time. Let us save such attractive flowering trees as the thorn-apple, the dogwood, redbud and shadbush, and such shrubs and vines as the red osier, witch-hazel, wild rose, sweet-fern, meadow-sweet, clematis, bittersweet, wild grape and woodbine, and even the elder and sumac. If we realize that all these plants are grown in great quantities in nurseries and used for ornamental planting in parks and private grounds, we shall see that they have value, and surely it is unreasonable to destroy such plants and at the same time provide for other planting.

—Charles F. Boehler, Landscape Engineer, Michigan State Highway Department.

Problems in the Reforestation of Watersheds---Part II

By George R. Taylor

Chemist and Bacteriologist, Scranton Gas and Water Company, Scranton, Pa.

THE species of trees which should be planted are, first of all, those which are native to your particular section. In addition, experimental planting should be made of various other trees which may seem desirable. Planting should not be confined to a single species, any more than you should put all your eggs into one basket. Consideration should also be given to future utilization of the timber. A water system can make more use of the softwoods than of the hardwoods. With us the prevailing types of trees are the hardwoods, such as maple, oak, beech, and birch, so there has been no necessity to plant them. In selecting a species for a given tract, consideration must be given to the nature of the ground—swampy or dry, sheltered or exposed, whether open or covered with undergrowth, type of soil, and various other factors.

The following table will give the habitats of the principal softwoods of the eastern section:

Species	Soil	Shade
White pine, P. Strobus	Moist to moderately dry	Very tolerant
Pitch pine, P. Rigida	Drier soils	Will stand some shade
Red pine, P. Resinosa	Moist to dry soil	Will stand some shade
Norway spruce, Picea Abies	Moist to swampy soil	Intolerant of shade
European larch, Larix	Gravelly soils	Intolerant of shade
Scotch pine, P. Sylvestris	Anything except swamp	Intolerant of shade
Austrian pine, P. Laricio	Dry to moist soils	Intolerant of shade

If you are fortunate enough to have old fields available for planting, you can put in almost any species you wish and get satisfactory results. If you are planting old fire burns covered with sweet fern, briers, tangles of scrub oak and groves of poplar, fire cherry and gray birch with an occasional oak or maple thrusting its green crown up above the tangle to belie its fire-scarred trunk, you are practically limited to white pine on the drier tracts and either white pine or Norway spruce in the wetter locations. We have been trying pitch pine, P. Rigida, in places of moderate shade, but have not had enough years of experience to determine how satisfactory it is going to be. White pine and Norway spruce are shade-loving and will eventually find their way up through scrub oak and other low-growing bushes. The trees obtained for planting are seedlings from one to three years old and four to ten inches in height. They may be bought from private nurseries, as were our earlier plantings.

Of recent years the Pennsylvania Department of Forestry has furnished forest trees free to planters, making a charge to cover the cost of digging, packing and transportation. A number of other state forestry departments are doing the same thing, and it is an activity which water-works people should urge in all states. Pennsylvania this year is sending out 4,000,000 seedlings; next year they expect 6,000,000, and in 1924 and thereafter they expect to have 20,000,000. The trees are bunched in fifties, boxed and shipped by express. Immediately upon receipt they should be inspected and "heeled in" in the ground. To heel in, a furrow about 4 inches deep should be plowed in good soil which is reasonably free from stone. The bunches should be put in this furrow and the dirt packed back about the roots, covering the stems in part. The row should not be more than two bunches wide to avoid heating. If the ground is partially shaded, so much the better. Heeled in in this way, trees can be kept in perfect safety for two weeks during March and April.

We plant the trees from 4 to 6 feet apart, generally about 4 feet. The latter distance means 2,700 trees to the acre, while 6 feet requires 1,200 trees per acre. We make the holes with broad-bladed picks known as mattocks. Following the pick men, come the droppers, carrying the trees in pails having a little water in them to keep the

trees moist. One man will drop for two to three rows of pick men. Behind these come the men who actually plant the trees, one man to each row. The planting is very simple. Just stick the tree in the hole and scrape the dirt back in with the hand, a scraper, or, as some of our men seem to prefer, a small stone. This stone is then used to pack the dirt around the tree by striking the ground with it. Another way to firm the tree in is to step on the dirt that has been thrown back into the hole. This firming-in process is very essential in tree planting. The imperative precaution to be taken in handling is the same as that for transplanting all trees—do not let the roots dry out. Bunches must not be left around to be exposed to the sun or air, and the work should be so handled that those covering the trees keep well up with those dropping them. To mark the planting line, the outside line of holes should be left unplanted on each trip across the piece of land being planted. If the planting site is at a distance from the place where they are heeled in, enough trees for the day's work should be brought up and heeled in at a convenient spot. In old mowing land where the land is smooth, it may be found advantageous to plow shallow furrows to facilitate planting, although we have always stuck to hand planting. Where the ground is favorable, a force of men will put in 1,200 to 1,500 trees per man a day. In wild land covered with scrub oak and briers the average may drop to 500 trees a day. The total cost of the trees in the ground, including the department charges for digging, expressage, and our labor for planting, will run from $3 to $5 per 1,000 trees.

Trees should be planted as early in the spring as the ground is workable. Trees planted in March and early April do very much better than trees set in May, as the earlier trees get rooted before the hot weather of July scorches them. Many failures are traceable to late planting, and even if they survive they remain in a stunted condition for some years before making a start. After planting, little need be done for the trees except to keep out fires. In later years will come questions of thinning and utilization of the smaller trees in the tracts which are being overgrown. These questions have not come up with us as yet. One method of planting which has been tried in some instances is to plant the alternate rows to evergreens suitable for Christmas trees. In a few years these could be removed and sold, thus giving an early income from the area. The feasibility of this is debatable, and we have never practised it. The mixed planting of trees has certain advantages over planting in pure stands. One important thing is that it tends to cut down damage due to disease.

We began our planting in 1912, putting out 80,000 white pine. We continued planting pine at intervals until 1918, when we began experimental plantings of different species. We have now put in 985,000 trees, of which 513,000 are white pine. We have tried Scotch pine, red pine, pitch pine, European larch, Norway spruce, white ash, and black walnut. The results have been somewhat varied in character. Some have been unqualified successes, others are as yet uncertain. By far the greater part of the trees have lived, although in some instances the growth has been very slow. Scotch pine has not grown very rapidly with us, contrary to general experience. The pitch pine plantings have been too recent to form any definite idea, but as it is a local tree there is no reason why it should not succeed if the particular site is favorable. European larch has been a complete failure with us, both in growth and in withstanding our severe winters. One planting has only 5 per cent of the trees living; another under different soil and exposure conditions has 40 per cent living; while a third is somewhat between the two. Norway spruce has given us 90 per cent living, but the seedlings do not grow. Some that were set out in 1918 have not grown more than 6 inches in that time. White ash was a complete failure with us, as was also the planting of black walnut nuts. Red pine has been a great success with us so far. Practically 100 per cent of the trees have lived, and the growth has been very satisfactory. We find, however, that they are very intolerant of shade. In one field there is a large patch of sweet fern, covering nearly an acre. The red pine will not come up through this, but either dies or stands still without making any growth. We plan to use red pine and pitch pine in the near future wherever it is possible. Yet, because of scrub growth already existing, probably 90 per cent of our land must either be planted to white

pine or allowed to go through the slow and frequently unsatisfactory process of natural regeneration. Pitch pine and red pine are moderately resistant to fire, owing to the large amount of pitch in the bark. Pitch pine, in particular, will live through surface fires which kill all other trees.

Tree Diseases

The problems of tree diseases are becoming more and more pressing every year. We are only too familiar with the ravages of the chestnut blight and the resultant wiping out of the chestnut tree. The various scales attack some of our forest trees, causing considerable damage. White ash is particularly affected by it, and in our own section ash sprouts are being killed by scale to an alarming degree if one considers the relative scarcity of the trees and their high value for lumber. White pine is attacked by the weevil, occasionally to such an extent as practically to destroy a plantation. The weevil is a white grub which bores the pith of the leader, killing it. The tree is thus forced to make one of the lateral branches into a leader, in this way producing a crook. Usually the infection is not heavy enough to cause any more serious damage than this. The ravages of the gypsy and brown tail moths in New England are well known. All of those except the weevil were imported. The most serious importation of all is the white pine blister rust, which was brought into New England on imported white pine seedlings, some twenty years ago. The disease has spread slowly over the North until it is pretty well distributed over the white pine territory and threatens to wipe out the white pine tree as the chestnut blight has the chestnut.

White pine blister rust is an infection of the inner bark of young branches of white pines, which slowly travels down the trunk and eventually kills the tree. The life-cycle of the rust is in three stages, the first two stages of which are passed on white pine, while the third stage is passed on members of the Ribes family, that is, currants and gooseberries, either wild or cultivated. Its first stage on the pine is the dormant stage, which lasts from two to four years before passing into the second, or active, stage. In this stage the bark is killed in the center of the infection, and toward the outer portion of the infection spores are produced. At the extreme edge mycelium threads extend the disease farther down the limb into the trunk bark. When the infection reaches the trunk, the killing of the whole tree takes place rapidly. The spores produced in the active stage on the pine can grow only on leaves of members of the Ribes family, i.e., currants and gooseberries, either wild or cultivated. In

A FIELD OF 100,000 WHITE PINE SET OUT IN 1915

the third stage on Ribes, spores are produced which will develop only on members of the five-needled group of pines, the principal of which is white pine. Here it begins its life-history over again.

It is evident that this rust will develop and spread only in those sections where both white pine and Ribes are present. It

is thus possible to grow either one of the two in a given district, but not both. An infected white pine does not directly infect the white pine which stands beside it, but the spores must pass from the diseased tree to some currant bush. New spores must be formed, and these pass back to the sound pine tree. The spores which are formed on the pine tree are of high vitality and may be transmitted over long distances by the wind, animals, birds, moving vehicles and other agencies. The spores which are formed on the Ribes plant are frail and of low vitality, so they are carried only relatively short distances. We are thus finding, rather unexpectedly perhaps, that currants and gooseberries are becoming infected over wide areas which were supposed to be free from the disease, but that the infection of the white pines is taking place more slowly and over more limited areas. From 100 to 600 yards may be set as the limiting distances over which infection of the pines from diseased Ribes may take place, with 200 yards representing the maximum, except under extremely favorable conditions.

It will be seen that we are not facing wholesale slaughter of the pines, as was the case with the chestnut tree. The fact that the disease does not spread from tree to tree makes its progress slower and, furthermore, makes the possibility of its control much more certain. Control of the white pine blister seems possible through extermination of all gooseberries and currants which are within two hundred yards of a given stand of white pines. At first thought this may seem prohibitive in its cost, but work which has been done in New England and New York indicates that on many tracts the costs are very reasonable.

You naturally ask, why plant white pine at all under these conditions? There are several reasons why we should continue to plant white pine if there is any possible chance of success: first, there is no tree which produces timber of the quality of white pine; second, white pine will thrive under a greater variety of conditions as to soil and moisture than most other trees; third, no other softwood except spruce can be planted in thick growths such as birch, poplar and scrub oak with any surety of the plantation's growing up through the scrub. In our opinion there is no other tree possessing the merits of white pine for general forest planting, and we are loath to give it up without a struggle. As to substitutes, there are no substitutes. Red pine seems the most satisfactory one to try. It is hardy, a rapid grower, makes good lumber, and is not subject to any known disease, but has the fatal defect, for us, at any rate, that it cannot be depended upon to come up through growth of underbrush; its use must be restricted to fairly open ground. In this respect it is similar to Scotch and Austrian pine and the larches. The spruces will endure shade, but are not very satisfactory for planting in the drier soils.

Tree diseases have made more complicated the problems of natural regeneration as well as those of planting. They have also brought up the question of the utilization of the dead and dying trees in the already existing stands.

We are operating a small portable sawmill, utilizing first of all the dead chestnut and other timber and, in addition, taking out mature specimens of all trees for which we have use. We saw our own rough construction material, together with such specialties as pipe blocks, stone boat, ties, wagon poles, fence posts and a variety of plank and timber. Much of this utilization work has been a direct result of the ravages of the chestnut tree blight. A considerable quantity has been sold as mine props, either on the stump or at the mine. Our own cuttings have been carried out in as careful a manner as possible, all brush has been burned, and in many cases the small chestnut sprouts have been removed to lessen the fire hazard and improve the general condition of the woods. We are sawing about 75,000 board feet of lumber every winter and 10,000 to 15,000 pipe blocks. Firewood, except high grade fireplace wood, has no value in the anthracite region, so everything below log size must be burned. The cost of operation is necessarily high, as we are picking the cut out of the general forest growth. However, we have been able to produce lumber at approximately local cost price when engaged on straight lumbering work. We feel that we have further done a valuable work by removing dead and dying timber which was rapidly becoming a serious fire menace. There is another factor to be considered

here, and that is the constant employment furnished the men. This is of great value in lessening seasonal unemployment.

Summary

First, fire protection is the Alpha and Omega of reforestation. Without it all attempts are useless.

Second, plant the varieties which are native to your section and which will furnish the lumber you desire. Experiment with such other varieties as give promise of success.

Third, keep a constant watch for tree diseases. Cooperate in any way with the various state and national agencies which are endeavoring to combat by quarantines and various wars of extermination the microscopic enemies of forest life.

Fourth, utilize the existing timber which you already have.

Finally, regard reforestation as a necessary water-works policy, not merely because of its possible economic value, but on the broader grounds of sanitary control, greater stability of run-off, and conservation of the timber resources of the nation. We should feel it a duty to recreate "Penn's Woods," that our children's children may derive their water-supplies, in part at least, from the fair green forests of our forefathers.

ACKNOWLEDGMENT.—From a paper read at the convention of the American Water Works Association, Philadelphia, Pa., 1922.

The Social Menace of the Rat

By C. V. Craster, M. D.

Health Officer, Newark, N. J.

ALTHOUGH there are two main species of rats, the black and the brown, the brown rat, often mistakenly called the Norwegian rat, is by far the most numerous and important. The brown rat is really a native of China, and his world-wide distribution is the result of successive waves of invasion westward across Europe and finally in merchant ships to America and the Antipodes. Until the year 1727 the black rat lived unmolested in Europe, in which year it is recorded that numerous swarms of brown rats were observed swimming across the River Volga. The reason for the invasion of this rat from Asia was probably the need for a new food supply for the rapidly increasing rat population.

Larger, fiercer and more omnivorous than the black rat, it quickly established itself in Europe and the British Isles, slaying, devouring and driving the more gentle black rat before it until the latter leads a precarious and uncertain tenure of life in places where the brown rat cannot reach it. Many stories are told of the fierce and ruthless character of the brown rat. Although a herbivorous animal, it will eat anything, and when hard pressed for food readily devours its kind.

It is extremely prolific and the rate of increase depends only upon the opportunity for an abundant food supply. When forced by starvation rats will migrate in immense troops in search of food. These migrating hordes are reported from time to time from all parts of the world.

There is also an annual migration of these animals from the cities to the countryside farms and lanes, attracted by the green food and the presence of smaller game. A return to the cities takes place in the fall, when the outside food supply fails.

There is no human foodstuff that the rat will not eat readily and its voracity is extraordinary. Not only is the loss of foodstuff for rat sustenance great, but the accompanying destruction of food supplies reaches enormous proportions. Not only are foodstuffs of all kinds ruined, but great damage is done to property by the destruction of woodwork, masonry and plumbing. It is estimated that the total cost for our rat population amounts to $180,000,000 per year, or $1.80 per person in this country, and it is calculated that the loss involved represents the constant effort of more than 200,000 men to produce the materials consumed and destroyed by rats. It is difficult to estimate the rat population in America, but it is conservative to say there are two

or three rats to every person in North America. According to Lantz of the U. S. Bureau of Biological Survey,

"The destruction wrought by this vast horde of rodents is far greater than that wrought by lions, tigers, wolves and all other noxious mammals together. The damage done by any species of insect is usually confined to certain geographic limits rarely extending over large parts of a continent; that done by the rat extends over the whole world."

Not alone from the side of food and property damage is the rat a menace to man, but also from the hazards of disease transmission. The relation of the rat to public health was not suspected until twenty years ago, when the Indian Plague Commission showed that plague was communicated by means of the rat infected with the disease and by the rat flea which left the body of the animal dead of the disease and by means of its bite brought about infection of human beings. It was clearly shown that in all plague epidemics there are existing or preceding epidemics of the disease among the rat population.

RATS ARE A MENACE!
KILL THEM! STARVE THEM!
DIRT and DESTRUCTION
Rats cost the people of this country $180,000,000 per year, or $1.75 per person.
One rat eats 50 pounds of grain per year and destroys a much greater amount.
Food is polluted in homes, stores and warehouses by the rats.
DISEASE and DEATH
Bubonic Plague is spread by rodents, and now we find them spreading Epidemic or Trench Jaundice. Other fatal diseases may be their contribution to society.
"THE FOUR HORSEMEN"
OF DOMESTIC EVIL:
Dirt, Destruction, Disease and Death
STARVE THE RATS
Do not keep food exposed or in paper or cardboard containers. Food protected in glass, metal or wooden containers cannot help feed these pests. They will leave before they starve
TRAP THEM
Set plain spring traps along base of walls where rats run. No bait is needed. Be careful in handling traps and keep children away.
POISON THEM
If traps are impracticable use Barium Carbonate mixed with four times as much flour and made into a dough.
Provide proper Garbage Cans and keep them Covered
AT ALL TIMES!
DEPARTMENT OF HEALTH
NEWARK, N. J.

NEWARK, N. J., USES THIS WARNING POSTER

Carriers of Disease

The role of the rat in bringing about bubonic plague having been thus firmly established, it is evident that historically it is responsible for more human deaths than all the wars known to humanity. The great plagues of the Middle Ages are now recognized as being bubonic plague. The Black Death which swept across Europe during the fourteenth century was a rat-borne plague, and was responsible for the death of over 25,000,000 persons. In India, the endemic home of plague, many thousands of persons die annually from this disease.

Rats transmit other diseases besides plague, notably trichinosis and various tapeworms. More recently it has been established that the rodent is responsible for the transmission of epidemic jaundice or Weil's disease. The infection was common among the troops during the World War and was a consequence of the enormous number of rats that existed in the trenches and dugouts and that carried the infection by contaminating food and food utensils. Epidemic jaundice has been reported from

several states of the Union, especially the New England States and New Jersey. An inquiry sent out recently to the physicians of Newark revealed the existence of 90 cases of epidemic jaundice which had been under treatment in three months. It is probable that this number represents only a small proportion of the cases actually existing.

There is then every reason to call for a war against the rat, not alone by reason of the vast economic loss it causes, but because it is the inciter of disease, pestilence and death.

Exterminate the Rat

Although it is virtually impossible to exterminate the rat, steps can be taken for its suppression which will have far-reaching results. The main points of attack are the rat's habitation and its food supply. There is a vital need for the rat-proofing of warehouses and stores and the proper protection of foodstuffs, so that the rat cannot gain admittance to such supplies.

A building can be made rat-proof, and indeed a whole city may be rendered rat-free if a proper warfare against the pest is carried out. Rats will not thrive where there is not an abundant food supply. Once cut this off, and there must be a migration to more suitable locations. Rats may be destroyed by three methods—traps, poison and bacterial virus. Of these, the first is probably the most efficient if properly carried out.

To properly destroy rats it is necessary to know their habits and outwit them. A rat will seldom run across an open space, preferring to run close to a wall. They are cunning and cautious and avoid anything that looks suspicious. They are, however, very curious and will readily enter lengths of pipe and explore dark corners.

The best form of trap is the ordinary spring or guillotine trap, which can be bought for ten or fifteen cents. It is better to use the traps unbaited, as rats are suspicious of baited traps, but readily step on an unbaited one if properly placed. Set several traps along the sides of rooms or the footing of walls. They may be set in a semi-circle around a rat-hole or one after another along a rat-run. It is better to run six or seven than two or three. It is just as well not to attempt to close the rat-holes, because they will soon find other ways of entrance unless the building is properly rat-proofed. Diligent trap-setting will quickly exterminate all rats in a building.

There are many rat poisons on the market, with many and various claims made. Barium carbonate is one of the best of these, made up with flour in the proportion of one to four into a thick paste. The objection to the poison method is the possible nuisance of the dead rat on the premises. The viruses cause similar objections in spite of the fact that claims are made that the animal will come into the open to die. Whatever method of destruction is adopted, it should be persisted in until success is assured. "Man," says Lantz, "has been fighting the rat for centuries and has made little progress. The rodents are entrenched in fortresses of man's own building. If they are driven out or overcome for a time, others soon swarm from neighboring premises and the battle has to begin anew. The work has been made abortive by providing continued subsistence for the rodents and by failing to destroy their entrenchments."

There can be no question of the need of a united and constant campaign to eliminate the rat menace. Rat-proof building should be the requirement for our dwellings; rat-proof food supplies in our warehouses and stores. The open garbage bucket in the house and the improper care of offal in slaughter-houses and meat stores are constant reserves of food supply for the rat. He will remain only as long as his food supply lasts. Like his fellow pest the housefly, his existence depends upon the careless habits and indifference of the average individual. It is indeed time that the rat be no longer tolerated in well-kept cities.

Philadelphia Builds 94 Miles of New Streets

During the past two years the city of Philadelphia has paved 75 miles of streets, and it is rapidly completing 19.5 miles more. The additional 19.5 miles will be laid on 140 streets and avenues in various sections of the city. Broad Street, Philadelphia, has long been recognized as one of the finest asphalt streets in the country. According to F. C. Dunlap, Chief of the Philadelphia Bureau of Highways, analyses of all the city's sheet asphalt pavement indicated that more than 50 per cent is over 15 years of age, and in view of many such records and the city's experience with other types of construction, the Bureau has adopted sheet asphalt and granite block as standards for the most heavily traveled streets.

Is the Road Surface the Proper Place for Direction Signs?

By George H. Nye
City Engineer, New Bedford, Mass.

EDITORIAL NOTE.—*In submitting the following article for publication in* THE AMERICAN CITY, *Mr. Nye expresses the hope that the methods used in New Bedford may be criticized by those having experience with traffic regulation in other cities. The editors will welcome such comments for publication in a future issue, and especially on the question of whether public safety is promoted by expecting drivers of automobiles to read direction signs on the street surface.*

NEW BEDFORD, MASS., with about 130,000 population, is a very old city, as cities go, in this country, and the streets in the central or older section are mostly 40 feet in width with 8-foot sidewalks and 8-foot-radius corner curbs. The blocks are short and the buildings close to the street line.

The effect of this on automobile traffic is to create numerous dangerous crossings, with obstructed views, narrow roadways, and much passing.

In 1921 a considerable number of silent policemen or dummy cops were purchased and placed at the worst of these crossings. The autoists said the dummies were an actual obstruction to traffic and had no right in the street. No better method of regulating traffic was known, however, for it was too expensive to maintain regular traffic officers on the 90 or more corners where regulation was desirable.

The Mayor, Walter H. B. Remington, then took a hand and directed the City Engineer to study the traffic problem in general and report to him some method of regulating without obstructing or endangering the traffic. This was a subject in which I was already deeply interested, as I had been impressed with the methods recently adopted by the Massachusetts Highway Commission, of painting guiding marks and symbols on the surface of the road. I firmly believe that the surface of the road, which the driver of a car should be watching at all times, day or night, is the proper place for signs.

As all motorists know, it is easy enough to find one's way over the main roads in the open country, but easy to lose it in the cities and towns when, even if sign-posts are located quickly by a driver, there is no opportunity to read them while driving a car through traffic. I reported to the Mayor that I thought a satisfactory method of marking our streets on the surface could be worked out, covering both the use of the street and the guidance of strangers through the city by the best routes.

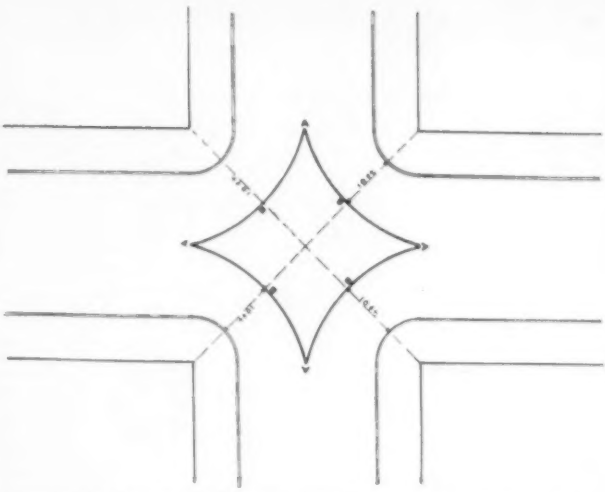
The Board of Aldermen ordered the City Engineer, Superintendent of Streets, and Chief of Police to have the streets marked by painted lines, words and symbols on the surface in such manner as should be approved by the Mayor.

The method used was as follows: Each corner was considered as to its use, and the lines were so marked as to allow motorists to travel where they most desired, if it could be done with safety, thus following the lines of least resistance and reducing the tendency to violate regulations. For this purpose the intersections were considered as a series of traffic lanes and not as a geometrical figure.

Taking our hardest situation—that of the intersection of two 40-foot streets with 8-foot sidewalks, 8-foot-radius corner curbs, and 24-foot roadways, the following method was pursued: First, the points "A" were determined at the middle of one street on the side of the other; then the points "B" were marked on the diagonals, allowing just room enough from the curb corner for one traffic lane to care for cars making the right turn, which naturally desire to keep as far to the right as possible. The minimum width of this lane was made 10 feet in case of 40-foot streets, 11 feet in case of 50-foot streets, and 12 feet in case of wide streets. A circle passing through two of the "A" points and one "B" point was found to have a radius of about 27.5 feet, or a turning circle of 55 feet diameter for

a car to make, with the further advantage that a car approaching or leaving a point "A" could go further to the left and enter the circle partly turned and with a space beyond the second point "A" to complete the turn, being required to keep within the safety line only during that part of the turn where the view was obstructed.

This arrangement leaves the maximum amount of room possible for the use of the car making the left turn, instead of wasting valuable space in the street by passing the geometrical center before starting the turn. These lines have proved so easy to follow that the public is both pleased and surprised and we have received many favorable comments.

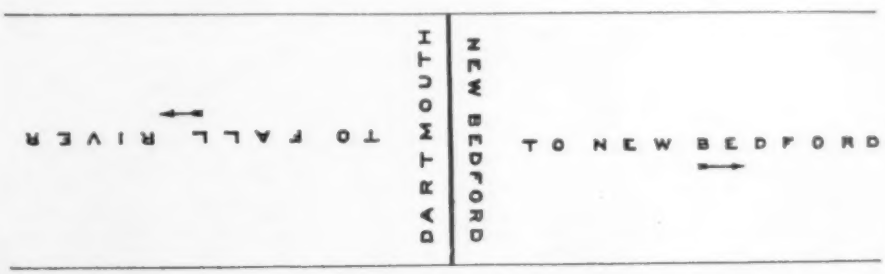


TRAFFIC LANES MARKED ON NEW BEDFORD'S PAVEMENT

In regard to the direction markings, I can only describe our own case. One main road enters from the north and passes over four miles of city blocks to the center. Another route is from the center to the small towns and shore resorts to the south of the city, and a third line passes through the center of the city leading from the cities west of New Bedford to Cape Cod on the east.

We chose for routes for strangers practically the routes given in the automobile road books, and for a designating color the same color used by the state in marking these through routes. At the city line on each of these routes we have marked the name of the city or town on either side of a broad white line representing the town line. A short distance from the town line, with the top of the letters on the center line of the street, we have printed the words "To New Bedford" or "to . . . . [the other city]," running longitudinally with the road and faced so as to be easily read by the driver on the left side of the car. Under the direction sign is a long arrow of the appropriate color.

Beyond the direction sign is a series of arrows of the same color as the first, placed at sufficiently frequent intervals to give a stranger confidence, and showing all the turns to the center of the city. At the center of the city between the hotel and the Post Office and at the intersection of the north-and-south routes with the east-and-west routes, is a zero or initial point with signs and arrows for all four directions.



THE PAVEMENT IS THE SIGN-BOARD

The sketch on page 435 shows the marking at the northerly line and is typical of all.

Great care was taken to keep the warning signs to the minimum number, to make the markings with the fewest words possible, and to make the utmost use of the symbol of the colored arrow, which can be noted at a glance. The direction letters are white on asphalt and are made with 4-inch lines, are about 15 inches in height, and spaced about 3 feet apart.

Another innovation for this city, introduced by the Superintendent of Streets, Horace Borden, is the marking of the street names in white paint and good-sized letters on the vertical face of the curb in such a position that the driver of a car can always locate the names of cross-streets by looking at the face of the curb on the further right-hand corner of the street which he is approaching. This, again, enables a driver to locate his signs in traffic while still keeping his eyes on the road, and he is not obliged to look for a sign that may be on a pole, street lamp or building on any one of four corners. They are also in the circle of his headlights at night.

Another great advantage in painting signs on the street surface is that the city absolutely controls the surface and can prevent any but official markings from being placed thereon. The drivers will soon learn that here is the place to look for directions, and helpful directions only. How many of us when driving in traffic have held up at an official-looking sign which says, "*Stop!* Go to Smith's for fried clams." The elimination of such advertising on trees, poles, fences, etc., will be a great help to drivers and a not wholly regrettable loss.

While there is some criticism from those who believe this is all wrong because it was never done before, and that a sign is some sort of a pole fruit because they always did grow on poles or buildings, I believe we have something good, and the majority of the comment by the users of our streets confirms this opinion.

Road Demonstration at State Fair

Urban and Rural Visitors are Shown a Practical Method of Building and Maintaining Secondary Roads

TO demonstrate a practical method of constructing and maintaining the secondary roads of the state, the New Jersey State Highway Department has this year employed a novel and effective plan. The Trenton Fair, which is held annually in the State Capitol, attracts thousands of people from all parts of the state, including farmers, highway contractors, road engineers and superintendents, township committeemen, and many others actually interested in highway work. In order to take advantage of the opportunity of demonstrating to this class of people an approved method of maintenance, a demonstration road was constructed.

This sample road is made of cinders from soft coal. After the cinders were dumped and spread, they were rolled with a light-tandem roller to effect as much consolidation as possible. The next step was to apply Texaco road oil, containing approximately 55 per cent of asphalt. This road oil served as a dust layer and also as a consolidation and binding medium. After the road oil was applied at the rate of one-half gallon to the square yard, the roller was again run over the entire surface.

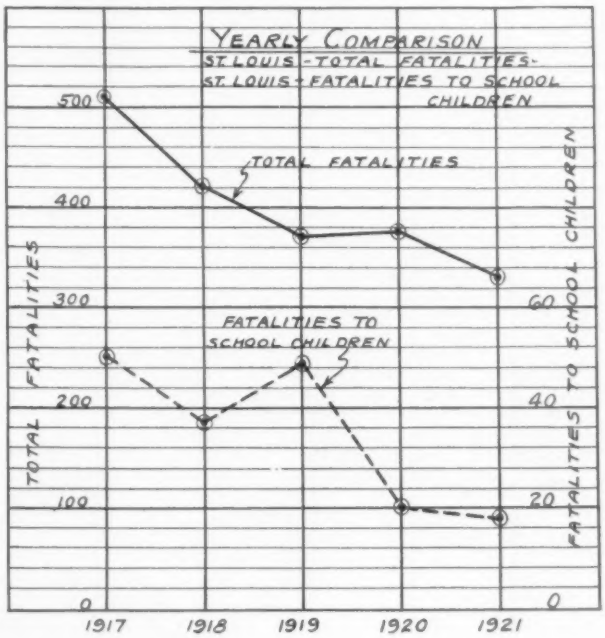
The purpose of this sample road is to show farmers, highway contractors, township committeemen, and road engineers an efficient method of building and maintaining the side roads of the state. The State Highway Department points out that such a road would not serve as a main state route, but that it demonstrates a method to be used in the all-important work of keeping side roads made of earth, sand, clay, cinders, etc., in good condition.

The use of coal cinders and asphaltic road oil as materials to form the surface of side roads has demonstrated its practicability in several different localities. The village of Southampton, L. I., has had particularly good results from this procedure. This village employs this method on bridge approaches on its side roads, and has found it to be economical and serviceable.

How the St. Louis Schools Have Reduced Accidents

By E. George Payne, Ph.D.

THE reduction of accidents is a cooperative enterprise. The success of this work in St. Louis is notable because the St. Louis Division of the National Safety Council has been able to enlist the cooperation of all the agencies in the city interested in the saving of human lives. The Council has been the clearing-house which has secured the cooperation of the courts, the city administration, the Chamber of Commerce and business interests, and the schools. The accompanying graph shows the success of this cooperative undertaking in the reduction of accidents to school children between six and sixteen years of age.



With the exception of a slight decrease in the number of deaths of school children in 1918, when work was temporarily carried on in the schools, there was no reduction of the number of children's deaths until the comprehensive plan of teaching accident prevention was introduced into the schools in December, 1919. The effective work of the Council in saving adult lives and property affected the losses to children only slightly; there was no increase in the number of children's deaths—that is all that can be said. The number averaged about 50 per year from 1910 to 1919. With the introduction of an adequate school program of accident prevention in December, 1919, the number of accidents began a constant decline, which has since continued. In contrast to 49 in 1919 and an average of 50 per year for the preceding 9 years, there were 20 deaths from accident in 1920, 16 in 1921, and, if the record continues, 1922 will show a total of only 12.

This achievement has been brought about through direct instruction as a part of the various subjects of daily study. For instance, the utilization of accident situations and occurrences as a part of oral and written composition, drawing, arithmetic, geography, history, physical training, etc., has brought positive results. Unfortunately, space does not permit me to outline in detail the method by which education in accident prevention as a regular part of the school work is carried on.

Many of the children have been organized in the schools into Safety Committees and Councils for the purpose of creating a safety consciousness. The effectiveness with which

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The author of this article is now Professor of Education in Health and Accident Prevention, New York University, occupying the first chair of this kind in an American university. He was formerly President of the Harris Teachers College, St. Louis, and was Professor of Education, School of Education, University of Chicago, Summer Quarter, 1922.

this has been accomplished is illustrated by one of many such letters received before the close of the school year in June. A word of explanation is necessary. I was present at the meeting of a group of thirty children representing the various rooms of the Meramec School. The group was enthusiastically discussing methods and ways of preventing accidents, when the incident described in the letter occurred. The letter is as follows:

DEAR MR. PAYNE:

I am glad that I joined the Junior Safety Council. It is a great success at the Meramec School. The Safety Council is trying to put a stop to all accidents. There was a boy who hopped trucks; we made him come to our meeting. We had a trial. Then we made him give a speech about why he hopped trucks, but he hadn't any speech. We asked him if he wanted to join the Meramec Safety Council. He did so. We put him on a committee to keep boys from hopping trucks. He couldn't very well hop them himself while he told other boys not to do so; besides, we had our eye on him. I think this will cure him from hopping trucks. Anything that we can do to help forward this movement count on the Meramec boys. I hope you will come to see us again soon.

Yours truly,

HOWARD WHALEY.

TEACHING CHILDREN HOW TO SMOTHER FLAMES

AVOID DANGER
LOOK BOTH WAYS
before leaving the curb
WAIT until the policeman stops the traffic, then go with the traffic.
LOOK RIGHT AND LEFT
while crossing
Cross Only at the Crossing

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A SAFETY INSTRUCTION POSTER

The boy referred to was so impressed that he later became a capital safety "booster."

Not only is safety carried on through the regular instruction, Safety Councils and Committees of children, but the children themselves dramatize accident situations effectively. These dramatizations serve to impress other children and to make those taking part more conscious of the need of safety practices. The accompanying illustration shows how dramatization is carried out.

The secret of the success of school safety work lies in the degree to which safety may be made a vital reality to the children themselves. Nothing is of deeper interest to the children, nothing comes more nearly within their experience, and, finally, nothing is so completely within their own control. No wonder, then, at the success with which the schools have reduced accidents.

Educators have advocated for a generation the making of the school activities approach as nearly as possible to life activities. In the work of safety instruction and activities that ideal has been realized.

Hydrant Rentals and the Financing of Water-Main Extensions---Part I

Published in response to numerous requests for this information

State and City	Population	Ownership	No. of Services	Per Cent Metered	City Pays Hydrant Rental?	City Pays For Water Used?	Financing of Water-main Extensions
ALABAMA							
Guntersville	.....	M	400	10	No	No	Income
Jasper	3,246	P	600	75	Yes	Yes	By company
Mobile	60,777	M	14,848	60	No	No	Dept. revenue
Ozark	2,518	M	400	90	Municipal	....	General fund
Prattville	2,316	M	220	90	No	No	By city
Selma	15,607	M	2,200	87	No	No	Receipts
Tuscaloosa	11,996	M	2,000	95	No	No	Income
ARIZONA							
Clifton	4,163	P	800	36	$2.50 each per month	Regular rates	Surplus
Florence	.....	M	218	100	$500 per yr.	Fire Dept. only	Bond issue
Glendale	2,737	M	875	14	No	Yes	Bond issues and profits
Morenci	5,100	P	1,238	74	No	Yes	By company
Tombstone	.....	P	325	99	No	Yes	
ARKANSAS							
Batesville	4,299	M	480	100	$1,600 year 45 hydrants	No	Plant
Blytheville	6,447	P	980	100	Yes	Yes	Bonds
Clarksville	.....	M	800	100	Yes	No	
Hamburg	.....	M	300	50	Yes	No	Revenue
Hot Springs	11,695	P	3,100	100	Yes	Partly	Usual methods
Jonesboro	9,384	M	2,250	20	No	No	Earnings
Malvern	3,864	M	350	70	No	Yes	Returns from water sales
Pine Bluff	19,280	P	3,000	100	Yes	No	Company
Searcy	2,836	M	500	100	No	Yes	Bond issues
West Helena	6,226	P	1,000	10	No	....	
CALIFORNIA							
Alhambra	9,096	M	2,793	99.5	Yes	Yes	Assessment or general funds
Auburn	2,289	P	664	60	Yes	Yes	Company
Calexico	6,223	M	900	100	Yes	No	Bond issues
El Centro	5,464	M	1,600	60	Yes	Yes	Income
Fresno	44,616	M	15,000	10	Yes	Yes	
Fullerton	.....	M	1,300	100	Charged to Fire Dept. fund	No	Bond issue
Gridley	.....	M	700	90	No	No	Earnings
Huntington Beach	1,687	P	1,200	100	Yes	Yes	Income
Lindsay	.....	M	900	75	No	No	Savings
Lodi	4,850	M	1,600	1	$6 per year	$2.50 month	Bonds and revenue
Los Angeles	576,673	M	144,596	97	No	No	Consumers, except in bonded districts
Marysville	5,461	P	1,115	3	Yes	Yes	Company or bonds
Modesto	9,241	M	3,251	3	No	No	Surplus revenue and bonds
Pacific Grove,etc	.....	P	4,250	100	Yes	Yes	Revenue
Palo Alto	5,900	M	2,000	100	$1.50 each per month	Yes	Bond issues and surplus revenue
Pasadena	45,334	M	15,164	100	No	Yes	50c per front foot; balance by department
Red Bluff	3,104	M	900	3	No	No	
Redondo Beach	4,913	P	1,600	95	$2,000 per year for 50; remainder, $1.50 each per month	Yes	
Sacramento	65,857	M	15,000	None	No	No	Bonds
San Jacinto	.....	M	250	75	No	No	Consumers, credited in water used
San Mateo	.....	P	1,553	90	Yes	No	Surplus and dept. funds
Santa Barbara	19,441	M	5,980	90	No	No	Revenue
Sherman	.....	P	400	80	No	None supplied	Deposits from property owners refunded when revenue amounts to 20% of cost
Ukiah	2,305	P	750	75	$5 each per month	Yes	Receipts
Whittier	7,997	M	2,585	98	No	No	Bond issues or revenue
Woodland	4,147	M	1,500	None	No	No	Bonds
COLORADO							
Ault	.....	M	225	85	$25 each	No	Bonds
Brighton	.....	M	700	1	No	No	Bond issue
Brush	.....	M	.....	....	No	No	Bond issue
Denver	256,369	M	49,164	2	Yes	Yes	Surplus revenue; bond issues

State and City	Population	Ownership	No. of Services	Per Cent Metered	City Pays Hydrant Rental?	City Pays For Water Used?	Financing of Water-Main Extensions
Fort Morgan	3,818	M	1,200	2	No	No	Earnings and bond issues
Greeley	10,883	M	2,300	20	Yes	No	Income
Gunnison	.....	M	400	None	....	No	
Holyoke	.....	M	300	98	No	No	Bonds
Julesburg	.....	M	400	90	Yes	Yes	Bonds
La Junta	4,964	M	1,200	None	Yes	No	Bonds and revenue
Lamar	2,512	M	800	100	No	No	Earnings
Longmont	5,848	M	1,600	9	Yes	No	Earnings
Loveland	5,279	M	1,700	10	No	No	Revenue
Trinidad	10,906	M	3,302	10	No	No	Earnings
CONNECTICUT							
Bridgeport	143,152	P	23,306	20	No	Yes	Guarantee required from applicants which covers interest on investment
Collinsville	2,425	P	650	12.5	No	Yes	Company
Derby	11,238	P	1,303	19.64	Yes	....	
East Hartford	11,648	M	2,400	2	No	Schools only pay	Bond issues or revenue
New London	25,688	M	4,819	100	No	Yes	5% of cost per annum for 15 years, or until full amount is absorbed by consumers
Plainville	4,114	P	599	100	$25 each per year	Regular rates	10% guaranteed return on investment
Putnam	7,711	M	1,180	10	Yes	Yes	Earnings
Rockville	7,426	P	1,200	25	Yes	Yes	
Southington	5,085	M	1,300	10	Yes	Yes	Income and reserve
S. Manchester	9,000	P	2,000	100	No	Yes	Holding company
Stratford	12,347	P	.....	100	Yes	Yes	Company
Terryville	4,000	P	374	6.5	Yes	Yes	Income, reserve, borrowed money or bond issue
Wallingford	9,648	M	1,660	20	No	Yes	
Waterbury	91,410	M	10,500	98	No	No	Appropriation
Westport	5,114	P	700	80	Yes	Yes	Earnings and borrowed money
Willimantic	12,330	M	1,718	90	No	No	Receipts
Woodbury	1,988	P	169	None	Yes	Yes	Borrowed money
DELAWARE							
Middletown	1,399	M	250	None	Yes	No	City
Milford	2,753	M	520	1	Yes	Yes	Revenue
FLORIDA							
Dade City	.....	M	250	80	Yes	No	City taxes
De Land	3,324	M	1,200	95	No	No	Proceeds
Fernandina	5,457	M	350	60	Yes	Yes	Appropriations
Fort Pierce	2,115	M	550	50	Yes	No	Revenue and tax
Key West	19,039	M	80	None	Salt water fire system	....	Taxation
Kissimmee	2,722	M	550	100	No	No	Earnings
Monticello	1,829	M	210	100	No	No	None laid
Ocala	4,914	M	1,000	....	....	No	Earnings
Plant City	3,729	M	530	100	No	No	Bonds
Quincy	2,540	M	.....	100	No	No	Bond issue
Tarpon Springs	2,105	M	400	80	No	No	Bond issue
GEORGIA							
Acworth	1,043	M	110	5	No	No	Bonds
Atlanta	200,616	M	35,000	100	No	No	Appropriations
Augusta	52,548	M	7,800	100	No	No	General tax fund
Bainbridge	4,792	M	1,050	100	No	No	Bonds
Colquitt	810	M	.....	Part	Yes	Yes	Bonds
Doerun	.....	M	150	67	No	No	
Jefferson	.....	M	140	100	No	No	Tax levy and bonds
Jesup	.....	M	245	25	No	No	City
Marietta	6,190	M	1,100	100	No	No	Revenue
Milledgeville	4,619	M	530	70	Yes	No	Bond issue
Milltown	.....	M	80	100	No	No	City
Quitman	4,393	M	350	100	Voucher	Yes	Department
Thomasville	8,196	M	1,100	100	No	No	Revenue
Tifton	3,005	M	749	90	No	No	Bond
Trion	1,721	P	.....	....	No	....	Company
IDAHO							
Bonners Ferry	.....	M	400	1	No	No	Bond issue
Burley	5,408	M	1,200	100	Yes	Yes	Bonds
Caldwell	5,106	M	1,400	100	No	No	Earnings
Lewiston	6,574	M	1,791	80	No	No	Surplus revenue and bonds
Moscow	3,956	M	1,100	100	....	....	Department
Preston	3,235	M	650	None	No	No	Earnings or bonds
Shelley	.....	M	300	20	No	No	Consumers advance 75% of cost
Weiser	3,154	M	650	100	Yes	Yes	Revenue
ILLINOIS							
Aledo	2,231	M	650	100	No	No	Special assessments
Arthur	1,080	M	142	100	....	None used	City

State and City	Population	Ownership	No. of Services	Per Cent Metered	City Pays Hydrant Rental?	City Pays For Water Used?	Financing of Water-main Extensions
Berwyn	14,150	M	3,500	100	No	No	Special assessment
Bloomington	28,638	M	8,000	98	No	No	Special assessment
Bushnell	2,716	M	460	100	No	No	Water rent and taxes
Cairo	15,203	P	3,300	15	Yes	No	Company
Carrollton	2,020	M	525	100	....	....	Bonds
Centralia	12,491	M	1,850	100	No	No	Revenue
Christopher	.....	M	550	20	No	No	Special assessment
Dallas City	1,450	M	150	100	No	No	Tax
Decatur	43,818	M	8,700	99.5	No	No	Special assessment
East Moline	8,657	M	2,000	98	No	No	Special assessment
Effingham	4,024	P	500	100	Yes	Yes	Company
Geneva	2,803	M	600	100	No	No	Special assessment
Havana	3,614	M	1,000	80	No	No	Income
Jacksonville	15,713	M	1,800	100	No	No	Under public improvement law
Kankakee	16,721	P	5,000	35	Yes	No	Company
Knoxville	1,818	M	313	97	....	No	Bonds
La Grange	6,525	P	2,400	95	Yes	No	Selling stock
Lake Forest	3,657	M	950	100	Yes	No	Special assessment
Lawrenceville	5,080	P	1,000	100	Yes	No	Company
Lena	1,168	M	300	100	No	No	
Lincoln	11,882	P	2,100	100	Pays for fire protection based on size of mains	No	Company
McHenry	1,031	M	220	100	No	No	Special assessment
Morrison	3,000	M	890	25	No	No	City
Morrisonville	1,126	M	45	100	....	....	General taxation
Mt. Pulaski	1,511	M	268	100	No	No	Special assessment
Mowequa	1,513	M	150	100	No	No	Municipal bonds
Normal	5,143	M	1,100	100	No	No	Bonds and by property owners
Oak Park	39,830	M	7,700	100	Yes	Yes	Special assessment
Ottawa	10,816	M	2,500	100	No	No	General funds
Peoria	76,121	P	18,900	71	Yes	No	Company
Peru	8,869	M	1,890	100	Yes	No	Water fund
Quincy	35,978	M	7,180	72	No	No	Surplus earnings
Rock Island	35,177	M	7,000	50	No	No	Special assessment or by department
River Forest	4,358	M	1,000	100	No	No	Special assessment
St. Charles	4,099	M	800	100	No	No	Special assessment
Streator	14,779	P	4,200	58	Yes	Yes	
West Dundee	.....	M	400	100	No	No	Special assessment
INDIANA							
Albion	1,213	M	281	100	Yes	No	Earnings
Anderson	29,767	M	4,000	45	No	Yes	Revenue
Aurora	4,299	P	850	52	Yes	Yes	Not doing any
Bedford	9,076	M	1,600	6	Yes	Yes	Earnings
Bicknell	7,635	M	750	40	No	Yes	
Bremen	2,084	M	510	100	Yes	Yes	Water fund
Columbia City	3,499	M	1,050	20	Yes	Yes	Water department
Decatur	4,762	M	944	100	Yes	Yes	Earnings
Elkhart	24,277	P	6,000	90	Yes	No	Company
French Lick	3,170	P	.....	....	Yes	....	
Gary	56,378	P	7,500	100	Yes	No	
Greentown	1,166	P	250	None	No	No	Company
Huntington	14,000	M	2,804	100	Yes	Yes	Department
Knightstown	2,008	M	650	100	Yes	No	Revenue
Lafayette	22,486	M	5,675	30	Yes	Yes	Department
La Porte	15,158	M	2,983	11	Yes	Yes	Surplus earnings
Lebanon	6,257	M	1,700	93	Yes	No	Revenue
Liberty	1,292	M	377	100	Yes	No	Fund derived from sale of water
Michigan City	19,457	M	5,500	None	After January 1, 1923	After January 1, 1923	Earnings and bond issues
Middletown	1,174	M	550	None	Yes	No	Budget
Mishawaka	15,195	M	3,200	100	Yes	Yes	Revenue and bonds
Newcastle	14,458	M	3,560	30	$40 each	Yes	Operating funds
No. Manchester	2,711	M	650	90	Yes	No	Special tax levy
Peru	12,561	M	3,300	2	Yes	Yes	Earnings
Rennsaelaer	2,912	M	800	50	Yes	Yes	Earnings
Richmond	26,728	P	5,525	70	Yes	Yes	Company
Seymour	7,348	P	1,400	....	Yes	Yes	Company
South Bend	70,983	M	16,000	100	$40 each per year	Regular rates	Earnings and bond issues
Summitville	1,387	P	300	None	Yes	No	Company
Tipton	4,507	M	2,300	20	Yes	Yes	Earnings
Union City	3,406	M	1,620	100	No	No	Bonds
Vevay	1,256	M	327	100	Yes	No	Water and light fund
Vincennes	17,210	P	2,800	50	Yes	Yes	Company
Wabash	9,872	P	3,000	40	Yes	No	Loans
Whiting	10,140	M	1,973	None	No	No	
IOWA							
Battle Creek	527	M	.....	100	....	....	
Belle Plaine	3,887	M	453	100	No	No	Bonds
Boone	12,451	M	2,250	100	.003 tax levy	No	Profits

State and City	Population	Ownership	No. of Services	Per Cent Metered	City Pays Hydrant Rental?	City Pays For Water Used?	Financing of Water-Main Extensions
Britt	1,303	M	500	None	No	....	
Burlington	24,057	P	5,824	4	.005 tax on property	No	Income
Chariton	5,175	M	700	100	No	No	Earnings
Charles City	7,350	M	1,200	100	No	No	Revenue
Cherokee	5,824	M	1,100	100	No	No	Earnings or bonds
Clarion	2,826	M	452	98	No	No	Bonds
Davenport	56,727	P	12,000	80	Yes	Yes	Company
Des Moines	126,468	M	24,372	99.4	$350 per mile of pipe	No	Department
Dyersville	1,511	M	275	100	No	No	General funds
Eagle Grove	4,433	M	800	95	No	No	Water-works fund
Fort Dodge	19,333	M	4,000	100	No	No	Earnings
Fort Madison	12,066	P	1,500	10	Yes	No	Company
La Porte City	1,233	P	250	99	Yes	None in city buildings	Company
Manchester	3,111	M	850	80	No	No	City
Mount Vernon	1,532	M	488	100	No	No	Water fund
Muscatine	16,068	M	3,000	75	No	No	Revenue
New London	1,144	M	140	100	No	No	General water fund
Rock Rapids	2,172	M	550	93	$3,000 year	20c M gals.	Earnings
Sibley	1,330	M	250	100	No	Yes	Tax levy and water fund
Sioux City	71,227	M	12,000	100	No	No	Receipts
Stuart	1,826	M	300	75	No	No	Not any
Sumner	1,404	M	900	100	No	No	Town
Villisca	2,111	M	300	98	No	No	Water fund
Walnut	950	M	50	100	No	No	Bonds
Waukon	2,359	M	550	90	No	No	Revenue
Winterset	2,906	M	345	100	No	No	None made
KANSAS							
Arma	2,180	M	400	100	No	No	Bond issues
Atchison	12,630	P	2,850	25	Yes	Yes	Company
Cherokee	1,452	M	380	99.5	No	No	Water funds or bonds
Colby	1,130	M	340	100	No	Have none	None made
Columbus	3,155	M	935	96	.5 mill levy	No	Bonds and appropriations
Council Grove	2,857	M	560	80	No	Yes	Earnings
Downs	1,427	M	410	100	....	....	
Ellinwood	1,000	M	125	100	Yes	Yes	Light and water fund
Ellsworth	2,065	M	400	100	Yes	No	Water fund
Emporia	11,273	M	2,750	100	No	Yes	Earnings
Florence	1,168	M	325	100	No	No	Bonds
Garden City	3,848	M	700	90	Yes	No	Earnings and bonds
Great Bend	4,460	P	650	100	Yes	No	Sale of securities
Independence	11,920	M	3,600	80	No	No	Receipts
Kingman	2,407	M	900	100	Yes	No	Earnings
Manhattan	7,989	M	2,100	100	$30 each per year	No	Bond issues or revenue
McPherson	4,595	M	1,198	100	Yes	Yes	Department funds
Moran	559	M	175	100	No	No	Bond issue or revenue
Osage	2,376	M	540	100	No	Yes	Revenue
Osborne	1,566	M	500	90	No	No	Bonds
Paola	3,238	M	965	10	½ mill	No	
Pleasanton	1,373	M	300	75	Yes	Yes	
Sabetha	2,003	M	380	50	Yes	No	City
Syracuse	1,126	M	300	100	Yes	No	Consumers
Washington	1,547	M	425	99	No	No	Bonds
Wichita	72,217	P	13,890	95	Yes	No	Consumer makes $9 deposit
Wilson	981	M	300	75	Yes	No	No extensions
KENTUCKY							
Barbourville	1,633	P	300	50	$40 year	Yes	Company
Bardstown	1,717	M	350	3	No	No	Taxation sinking fund
Covington	57,121	M	11,500	100	No	No	Appropriation
Hickman	2,633	P	497	70	Yes	Yes	Company
Hopkinsville	9,696	P	2,392	58	Yes	Yes	Earnings and bonds
Paris	6,310	P	1,500	....	Yes	Yes	Water rents
LOUISIANA							
Bogalusa	8,245	M	500	....	....	....	Bonds
DeRidder	3,535	M	550	80	No	None	Income
Leesville	2,518	P	350	5	No	Yes	
New Orleans	387,408	M	59,000	100	No	No	General tax
White Castle	2,289	M	.....	90	No	No	
MAINE							
Augusta	14,114	M	2,500	10	$1,000 year	No	Income
Bath	14,731	M	2,931	20	Yes	No	
Gardiner	5,475	M	1,657	....	Yes	No	Bond issue
Guilford	1,800	P	400	None	Yes	No	
Houlton	6,191	M	1,150	....	Yes	No	
Lisbon Falls	1,500	M	540	70	Yes	No	Appropriation
Lubec	3,371	M	496	25	No	No	Earnings
Phillips	1,500	P	175	None	Yes	No	Surplus
Presque Isle	3,452	P	553	2	Yes	Yes	None
Rumford	8,576	M	1,200	40	Yes	Yes	Profits
So. Berwick	2,955	P	305	5	Yes	Yes	
Warren	2,069	P	160	None	No hyd.	....	

State and City	Population	Ownership	No. of Services	Per Cent Metered	City Pays Hydrant Rental?	City Pays For Water Used?	Financing of Water-Main Extensions
MARYLAND							
Belair	1,005	P	380	100	Yes	No bldgs.	Town
Washington Suburban Sanitary District	.....	M	4,000	90	No	No	Bond issue
MASS.							
Arlington	18,648	M	3,318	100	No	Yes	Serial notes paid when due from earnings
Athol	9,792	M	1,600	4	Yes	Yes	Surplus
Belmont	10,744	M	2,023	100	No	Yes	Earnings
Brockton	66,138	M	10,149	100	No	Yes	Bonds
Brookline	37,748	M	6,114	100	No	No	Town or bonds
Cambridge	109,694	M	15,000	46	No	No	Receipts
Concord	6,461	M	1,375	4	Yes	Yes	Bond issue or revenue
Dedham	10,783	P	2,550	98	Contract	Contract	Bond issue
Falmouth	3,500	M	1,600	Few	Yes	Yes	Taxation and loans
Fitchburg	41,013	M	6,000	98	No	No	Loans
Framingham	16,785	M	2,781	100	Yes	Yes	Surplus revenue and bonds
Greenfield	15,642	M	2,960	13	No	Yes	Taxation and receipts
Hyannis	1,550	P	700	....	Yes	Yes	
Lancaster	2,406	M	500	90	No	Yes	Town
Lenox	2,691	P	311	95	Yes	Yes	Earnings
Littleton	2,200	M	227	99	Yes	Yes	Appropriations
Maynard	7,086	M	1,158	91	No	No	Town and applicant each pay half
Middleboro	8,453	M	1,130	100	No	Yes	Earnings
Natick	10,907	M	2,837	86	$10 year	Yes	Earnings
Needham	7,012	M	1,830	100	No	Yes	Earnings
New Bedford	121,217	M	16,685	100	No	Yes	Receipts or bonds
North Adams	22,282	M	3,500	18	No	No	Bond issue
Northampton	21,951	M	4,000	4	No	No	Charge 6% on cost of construction
North Andover	6,366	M	1,240	94.2	No	Yes	Appropriation
North Attleboro	9,238	M	1,500	100	$7,000	Yes	Vote of town
Peabody	19,552	M	3,300	85	Yes	Yes	General taxation
Randolph	4,756	P	1,230	45	No	No	Appropriation
Saugus	10,874	M	2,199	50	Yes	No	Appropriation
Sharon	2,060	M	663	2	$2,000 year for all purposes	....	
Shelburne Falls	1,515	M	355	100	No	Yes	Taxation
Shirley	2,257	M	286	100	Yes	Yes	Loans
Spencer	5,930	M	896	95	No	No	Revenue
Swampscott	8,101	M	2,050	100	$1,000 year	Yes	Bond issue
Taunton	37,137	M	6,091	71	No	Yes	Bonds
Waltham	30,981	M	4,467	98	$5 each per year	Yes	Earnings
Winchester	10,391	M	2,500	100	No	No	Appropriations
Winthrop	15,446	M	3,077	100	Yes	Yes	From earnings
Worcester	179,754	M	22,878	98	No	Yes	Loans or revenue
Wrentham	2,808	M	340	50	Yes	Yes	Appropriation or bond issue
MICHIGAN							
Adrian	11,878	M	2,800	46	Yes	Yes	Bond issues
Alma	7,542	M	1,400	100	Yes	Yes	Bonds and budget
Battle Creek	36,164	M	8,500	99	No	No	Earnings
Bay City	47,554	M	8,500	91	Yes	Yes	Earnings
Bessemer	5,482	M	700	7	No	No	City taxes
Big Rapids	4,558	M	1,000	None	No	No	Revenue
Charlevoix	2,218	M	1,000	100	Yes	Part	General tax
Clinton	1,011	P	60	5	No	Yes	
Dowagiac	5,440	M	1,350	100	Yes	Yes	Appropriations or bonds
Elk Rapids	1,673	M	250	5	Yes	Yes	None made
Escanaba	13,103	M	3,414	41	No	No	Reinvest depreciation reserve
Grand Rapids	137,634	M	.....	99	....	....	
Iron Mountain	8,251	P	1,800	40	$58 year	No	Company
Jackson	48,374	M	10,206	100	No	No	Bonds
Manistee	9,690	M	2,361	62	No	Yes	Water funds
Marquette	12,718	M	2,450	55	$25 each per year	Yes	Dept. funds
Marshall	4,270	M	1,000	75	$16 each per year	No	By department
Menominee	8,907	M	2,256	60	Yes	Yes	Earnings
Milan	.....	M	500	100	$40 each	No	General fund
Mt. Pleasant	4,819	M	1,200	98	Yes	No	Bonds
Munising	5,037	M	650	20	Yes	No	General fund
Muskegon Heights	9,514	M	2,000	100	....	No	Bond issue
Niles	7,311	M	2,000	90	No	No	Appropriations and income
Northville	1,665	P	600	25	No	No	
Oxford	1,191	M	.....	100	....	....	
Quincy	1,347	M	300	100	No	No	None made
Reed City	1,690	M	600	None	No	No	General fund
St. Joseph	7,251	M	1,800	90	No	No	Earnings
Sturgis	5,995	M	1,600	100	No	No	Bond issue

State and City	Population	Ownership	No. of Services	Per Cent Metered	City Pays Hydrant Rental?	City Pays For Water Used?	Financing of Water-main Extensions
Three Rivers	5,209	M	1,180	100	No	Yes	General fund
Traverse City	10,925	M	2,600	55	$35	Yes	Earnings
Whitehall	1,600	M	408	100	No	No	Taxes
Ypsilanti	7,413	M	2,100	80	$50 each per year	Yes	Earnings
MINNESOTA							
Barnesville	1,353	M	177	100	No	No	City
Caledonia	1,372	M	350	100	No	No	Assessment
Chatfield	1,228	M	1	None	No	Yes	Tax
Duluth	98,917	M	17,703	.....	Sometimes	Yes	Surplus earnings
Jordan	1,151	M	45	100	No	No	General taxes
Lake City	2,846	M	542	100	Yes	No	Revenue
Litchfield	2,790	M	500	100	Yes	No	Water and light fund or general fund
Luverne	2,782	M	900	100	Yes	Yes	General fund
Minneapolis	380,582	M	66,500	99	No	Half-rate	Receipts and assessment
New Prague	1,554	M	160	100	$25 each per year	Yes	Assessment
Pipestone	3,325	M	725	75	Yes	No	Assessment
St. Charles	1,159	M	400	75	No	No	City
Staples	2,570	M	205	100	Yes	No	Earnings
Two Harbors	4,546	M	1,100	40	No	No	Water and light fund
Winthrop	1,043	M	95	100	No	No	City
Zumbrota	1,138	M	205	100	No	No	City funds
MISSISSIPPI							
Charleston	3,007	M	400	90	No	No	Water-works fund
Louisville	.....	M	300	95	....	....	Proceeds of plant
Bethany	2,080	M	403	100	No	No	City or bonds
Bolivar	1,975	M	400	85	No	No	Bond issue
Brunswick	1,606	P	280	33	Yes	Yes	Company
El Dorado Springs	2,212	M	305	....	No	No	Bonds
Hannibal	18,950	M	3,880	15	No	Yes	
Lebanon	2,848	M	700	100	No	No	Monthly collection
Paris	1,474	M	312	100	No	No	General fund
St. Charles	8,503	M	1,400	5	No	No	Income
St. Louis	772,897	M	119,500	7.7	No	No	Revenue
Sedalia	21,144	P	3,500	80	Yes	Yes	Sale of securities and earnings
Trenton	6,951	M	1,300	100	No	No	Income
Unionville	2,000	M	150	50	No	No	Bond issues
Vandalia	2,158	M	300	25	No	No	Tax levy
Webb City	7,807	P	2,500	100	Yes	Yes	
Webster Groves	9,474	M	2,400	100	No	No	Bond issues
MONTANA							
Polson	1,500	M	350	5	....	No	Bonds
Sidney	1,200	M	144	100	Yes	No	Special improvement districts
NEBRASKA		½					
Albion	1,978	M	500	100	No	No	Property owners pay 50c per lineal foot; plant pays balance
Blair	2,702	M	500	50	Yes	Yes	Earnings and levy
Cedar Bluffs	500	M	145	97	Yes	No	Warrants
Crawford	1,323	M	446	91	No	No	Profits
Doniphan	500	M	120	100	No	No	Bonds
Edgar	1,080	M	270	100	No	No	Tax
Fairbury	5,454	M	1,200	100	No	No	Department
Grand Island	13,960	M	2,700	100	Yes	Yes	50c per foot frontage balance from water fund
Hastings	11,647	M	2,826	100	Yes	Yes	Assessment
Humboldt	1,176	M	328	100	No	No	Tax
Lincoln	54,948	M	11,843	100	No	No	Assessment
Madison	1,708	M	600	100	No	No	
North Platte	10,466	M	1,500	100	Yes	No	Water-main districts
Omaha	191,601	M	35,000	99	$60 each	No	Assessment
Red Cloud	1,686	M	500	90	No	No	Bonds
Wilber	1,230	M	450	95	No	No	Receipts and direct tax levy
NEVADA							
Goldfield	4,000	P	300	100	No	No	None

Building Boom is Reflected in Water-Main Extension Inquiries

The building boom which has extended practically throughout the United States in the last year has resulted in a large number of inquiries coming to THE AMERICAN CITY from municipal officials, asking for a statement of the methods used by various cities to finance water-main extensions. At the same time many cities seem to be experiencing difficulties in properly adjusting hydrant rentals, so that a large number of inquiries have also come from that source. We take pleasure in publishing the table above, which will be continued in the December issue of THE AMERICAN CITY, giving data not only on water-main extensions and hydrant rentals, but also on the population of the city, the ownership of the water-works, the number of domestic and commercial services and the per cent metered in each city.

Motor Trucks in Municipal Service

DETROIT'S NEW MUNICIPAL BUSSES HAVE RECORD CAPACITY

The Detroit Park Department has recently placed in service one of the largest passenger-carrying trucks in service anywhere to-day. It consists of a trailer mounted on a Packard tractor wheel-base chassis and has a seating capacity of 56, and a total capacity of 115 when persons are permitted to stand in the aisle. An air pump provides compressed air, which is used to operate the brakes and the mechanical equipment for opening and closing the doors which extend along the right side of the bus. Loading stations are provided at several points on Belle Isle, Detroit's largest park, and at the land terminal located at the land approach of the bridge. The loading stations are so placed that sharp turns must be taken, and the new carrier is so designed that it can make a complete turn within a radius of 35 feet. Busses leave the loading stations for the trip across the bridge at 15-minute intervals, and operate 12 hours daily.

ONE OF TEN NEW 3-TON WHITE TRUCKS ON STREET PAVING REPAIR, OWNED AND OPERATED BY THE CLEVELAND, OHIO, DIVISION OF STREETS

The various municipal departments in Cleveland now operate 92 White trucks

Chamber of Commerce Activities in Public Affairs

California Chambers in City Planning Contest

AN interesting feature of the Second Western Summer School of Community Leadership held in September at Stanford University, was a competition between the secretaries of California cities to establish the best record of progress in city planning during the preceding year. Each secretary was invited to prepare a brief statement of accomplishment in his city for submission to a committee of judges consisting of Professor Edwin A. Cottrell of Stanford University, Charles H. Cheney, city planner, and Roscoe D. Wyatt, President of the California Association of Commercial Secretaries. The committee awarded first place to Lynn W. Ballard, Secretary of the Long Beach Chamber of Commerce, and gave to two other contestants, L. D. Blodgett, Secretary of the Bakersfield Chamber of Commerce, and M. J. Haig, Secretary of the Whittier Chamber of Commerce, the privilege of reading their statements at one of the sessions of the student body.

The prize-winning outline of the city planning progress in Long Beach follows:

Real city planning must carefully consider not only the beautiful and the atractive, but the practical and the result-getting as well. Long Beach had this principle in mind in its work in city planning.

Naturally, the first thing in city planning is securing the planning commission. The Long Beach City Council early made provision by ordinance for the Long Beach City Planning Commission. City Manager Hewes named four citizen members, and the charter provides that the City Attorney, City Engineer and Manager shall also be members of the Commission, the City Manager being the presiding officer.

A planning commission without funds is helpless. The second necessary thing, therefore, was done, and a budget appropriation of $6,000 was provided, which, with $2,000 additional work by the City Engineer's office, made the first year's work possible. With the Commission and the funds for its work, after careful survey, the Commission was unanimous in the choice of Charles H. Cheney as consultant. The Commission and Mr. Cheney agreed that the budget provision was ample for the first year's work in a community of 70,000 people.

The two greatest things accomplished in the Long Beach Zone Ordinance are: first, permanent establishment of a large area of the city for the building of single-family dwellings only, thereby protecting and stimulating home ownership, which must be the backbone of any city and is one of the best guarantors of contented labor conditions, the greatest antidote for Bolshevism, and one of the things most sought for by new industries; second, the establishment of the first and only industrial zones in Southern California, where industries are protected instead of being only tolerated, that is, industrial zones where no residence permits can be obtained—industrial interests are paramount.

A comprehensive survey was made in which not less than fifty group meetings in neighborhood schoolhouses were held in all sections of the city. Because of the rapidity with which the city is growing, the work had to be done as rapidly as possible, and as an immediate protection the Zone Ordinance was prepared and adopted by piecemeal, the first within three months from beginning the work, the entire ordinance being completed and passed within eight months from the date of beginning. We believe it more satisfactory, where possible, to adopt the ordinance for the entire city at one time. This ordinance is comprehensive and complete, establishing:

1. The best use of property
2. The height of buildings

3. The area of lots to be covered in all parts of the city

The matter of a comprehensive major traffic plan was studied, and a tentative plan quite complete is now being given the best attention of the Commission. Within a few months we expect to have the traffic problem in the business section fully solved, together with a complete layout for the outlying streets and provision made for street building where the need is greatest.

The plan for the unification for all rail lines is well under way. After twenty years' work the Union Pacific has agreed to remove its tracks from Ocean Avenue along the front and is already building its freight station in the industrial district. The removal of the Southern Pacific tracks from Broadway is also under way, and the Southern Pacific and Pacific Electric are also building a joint freight terminal in the industrial district.

The establishment of a Park Commission has been recommended, and the personnel will be decided very shortly. The city budget includes approximately $40,000 for the improvement of parks this fiscal year.

No housing code has been adopted as yet, but the Zone Ordinance includes within its area-requirements most of the provisions of a housing code. A new building code has been prepared by the Building Inspector after conference with a committee of the Chamber of Commerce and is ready for adoption.

In addition to this definite work done, the first year has made possible the laying of plans for the completion of the entire program of what makes up a complete city plan.

We believe the big accomplishment necessary in every city is to bring the citizens to a realization of the desirability of a city plan and a very large majority commitment to it. This Long Beach has done.

A State Chamber of Commerce Referendum on City Manager Government

CHICAGO, ILL.—Chambers of commerce in thirty cities out of thirty-two voted in the Illinois Chamber of Commerce referendum in favor of letting cities of 5,000 population and over decide whether to adopt the city manager plan of government. In most cities the majorities were large. Members of the Illinois Chamber voted more than eleven to one in favor of submission.

The question as stated in the referendum was, "Shall the Legislature empower cities of more than 5,000 population to decide, by vote of their people, whether they shall adopt the city manager plan of government?" Cities of less than 5,000 already possess such power.

An actual poll of the membership was taken by the chambers of commerce in twenty-four cities, and among this number Benton, with a population of 7,201, was the only one which returned a majority in the negative. The vote was cast by directors, without taking a membership poll, in nine organizations, and in this list the only negative majority was returned by the Belleville Commercial Club. Belleville's population is 24,701. The Belleville Board of Trade did not participate in the referendum. Two commercial organizations in Moline, the Chamber of Commerce and the Business Men's Association, participated in the referendum, and each voted "Yes." In LaGrange, Litchfield, Mt. Vernon and Onarga, the vote was unanimous for the affirmative.

The complete affirmative vote was as follows:

Aurora	LaSalle
Belvidere	Lawrenceville
Bloomington	Lincoln
Cairo	Litchfield
Chicago Heights	Mattoon
Cicero	Moline
Danville	Monmouth
Decatur	Mt. Vernon
East St. Louis	Onarga
Galesburg	Ottawa
Hoopeston	Peoria
Jacksonville	Rockford
Joliet	Sterling
Kankakee	Urbana
LaGrange	Waukegan

The organizations participating in the referendum represented exactly one-third of the organization members of the Illinois Chamber of Commerce at the time the ballots were sent out. Since this time the organization membership of the Illinois Chamber has been increased to 102. The Chamber has 1,069 individual and firm members. It is generally considered that the Illinois Chamber's individual members, together with the members of the local chambers of commerce which are affiliated with the state chamber, make a total of 50,000 leading business men of Illinois.

T. R. MOSS,
Manager, Organization Service Department, Illinois Chamber of Commerce.

Arguments pro and con on the city manager plan are given in the printed referendum, copies of which may be secured from Harvey T. Hill, General Secretary, Illinois Chamber of Commerce, 10 South La Salle Street, Chicago, Ill.

A Busy Rest Room

Canton, Ill.—Canton's community rest room is one of the city's busiest centers. An average of 750 country people, shoppers, school children and out-of-town visitors use its facilities every day. The rest room, postal station, employment and information bureau are open from 8 A. M. to 10 P. M. Matrons are always in charge. Civic organizations and the B. & O. band and Red Cross have their headquarters in the room. Dollar Days, community advertising and other special activities are handled through the office. Canton is proud of its rest room.

CHESTER POWELL,
Secretary, Community Rest Room Association.

A Well-planned Investment

Anaheim, Calif.—A group of Anaheim Chamber of Commerce members recently bought for the California Valencia Orange Show, a subsidiary undertaking of that Chamber, the 15-acre Valencia orange grove of J. B. Andrews, situated northwest of the city limits. The price was $45,000. The deal was made possible by the issuance of 600 certificates of $100 each, making a capital of $60,000, for which 7 per cent interest is being paid. This sum includes $14,400 representing unpaid expenses of the 1921-1922 California Valencia Orange Shows. The Anaheim City Council offered to set aside 5 acres of their 20-acre new city park, and this offer has been tentatively accepted by the Orange Show Management, but they felt that with the growth of the city and the show, a larger piece of ground would be necessary within three years.

It is proposed to leave the new acquisition as an income-producer for the next two or three years, as the oranges will pay the 7 per cent on the whole capital stock and a wide margin for the best scientific up-keep obtainable. Ten acres of the new purchase will be held for exposition purposes, the remaining five to be sold or subdivided into lots, which in 1923 will undoubtedly net the Chamber $25,000 of its $45,000 purchase price. Within ten days of the signing of the papers an offer to buy was received which would have netted the Chamber $7,500.

Toward making the initial payment on the Andrews grove, the Chamber used $2,400 which represented its net profits on some apartments built under its direction in 1920, with moneys subscribed by its members, who received 10 per cent per annum during the life of their subscription.

MALCOLM A. FRASER,
Secretary, Anaheim Chamber of Commerce.

Chamber of Commerce Secures Interim Zoning Ordinance

Lowell, Mass.—Through the efforts of the Lowell Chamber of Commerce, an ordinance has been adopted by the City Council authorizing the appointment of a City Plan Commission and also authorizing this Commission to have a city plan prepared for Lowell. The Commission has been appointed by the Mayor and approved by the Council, and immediate steps will be taken for the preparation of a city plan.

The Chamber of Commerce has also caused to be introduced an ordinance providing for temporary zoning, which will be effective until the proposed city plan is completed. This has become necessary owing to the frequent encroachment of business in the residential districts of the city.

GEORGE F. WELLS,
Secretary-Manager, Lowell Chamber of Commerce.

Second Winter Carnival a Great Success

La Crosse, Wis.—The Winter Carnival of sport and fun held in La Crosse in January, 1922, was even better than the initial one of the year previous. The committee was able to correct faults of the first event, and a larger number of participants and a wider variety of events contributed towards making the recent occasion one long to be remembered.

The parade was the most notable feature of the celebration and brought out seventy-five marching clubs with about three thousand people in line. A great variety of color schemes was offered for the enjoyment of the multitude which lined the principal thoroughfares of the city. It required one hour for the parade to pass a given point.

In addition to the marchers themselves, several bands, about thirty drum corps and a score of floats took part in the procession. Other parades were held in connection with the crowning of the Queen of the Carnival at the Ice Palace, the residence of King Boreas II, and prior to the wonderful display of fireworks on the last night of the four-day frolic.

Some of the best-known amateur skiers

and a number of professionals participated in the skiing. Fancy skating, distance skating for both adults and juniors, dog-sled races and horse racing were other sports indulged in. Push-ball contests, hockey and curling also attracted attention, and both hockey and curling clubs have been started as a result of the carnival.

The streets were gaily decorated with evergreens, colored lights and the national colors, and during the principal events business houses closed to permit their employees to take part. Bands and orchestras were playing on the plazas every afternoon and evening, four dances were held each evening, a street animal circus gave several daily performances, and gayety reigned supreme.

The event was financed by a guarantee fund subscribed by the merchants and manufacturers of the city, and by the sale of carnival buttons and of votes for Queen of the Carnival. It was widely advertised in newspapers and by posters over a large area of Wisconsin, Minnesota and northern Iowa, and the various pageants were witnessed by large crowds of out-of-town people, who took advantage of the special reduction in railroad fares.

ELEANOR E. WHITING,
Assistant Secretary, Chamber of Commerce of La Crosse.

Publicity on the School Question

HENDERSON, N. C.—One of the major activities of the Henderson Chamber of Commerce this year has been its educational work, which resulted in a practically unanimous vote at an election for school bonds sufficient to erect three new, modern and up-to-date brick school buildings. At the suggestion of the Chamber, no limitations were made as to the specific use to which the money is to be put. After the issue was carried, the Chamber conducted an open forum on the school question. This forum was largely attended, and the School Board was made familiar with the wishes of the people. The forum was followed by a meeting in each of the four wards, with the result that satisfactory locations were selected for each of the three new school buildings, and there are no "knockers" left to criticise, because the public is in possession of all the facts as a result of our educational campaign. With but little adjustment, the public's wishes coincided with those of the members of the Board of Education who have charge of the work. Each of these new buildings will be ready before the holidays, and Henderson's need will have been taken care of. This campaign also made it possible for the School Board to employ for the boys in the High School an athletic instructor, who will be a member of the faculty.

GEORGE E. COMER,
Secretary, Henderson Chamber of Commerce.

Chamber Puts Over Successful B. & L. Campaign

AURORA, ILL.—Realizing the need for more houses in Aurora, and the fact that the Building and Loan Associations are equipped to handle loans for the building of homes providing they have sufficient funds, the Chamber of Commerce undertook to organize a stock-selling campaign in which the Real Estate Board cooperated.

On two occasions the Chamber of Commerce had attempted to organize housing corporations, but both of these attempts had failed—an experience which many other cities have had. The stock-selling campaign, however, succeeded. There was over a million-and-a-half dollars subscribed, which will result in at least one hundred additional houses for Aurora during the present year, and the effects of the campaign will be felt for the next one hundred months.

Newspaper publicity, in the form of advertising, editorials, and news items, was prepared and used for about two weeks prior to the campaign, and some publicity was used during the campaign. The advertising, as well as the news items, explained the Building and Loan idea from the standpoint of an investment and systematic savings.

The campaign was organized in four divisions, with a major presiding over each division, who in turn had his captains and lieutenants. One major was given all the factories. Each factory appointed a captain, who surrounded himself with enough workers to wait upon all employees. All told, the factory employees subscribed over one-half million dollars. The other three majors were responsible for the prospects provided their workers.

A city directory was used by the Building and Loan Associations to check off their present stockholders, who they felt could increase their holdings. The new prospects were also secured from the city directory.

Dallas makes her tax dollar do more

Dallas, Texas, after competitive demonstrations, bought three 5-ton "Caterpillars"* in June, 1921, for use in its street maintenance department. These machines proved so economical of time and labor that last April the City added another 5-ton and a 10-ton "Caterpillar"* to its fleet. City Engineer Fairtrace says: "Before we had "Caterpillar"* motorized outfits we could only smooth up our 300 miles of dirt and gravel streets once a year. *Now we are grading these same streets every six weeks, or eight times as often. And our yearly cost of street maintenance has not increased one penny.*" Hundreds of other progressive cities and towns throughout the country are using "Caterpillar"* power to reduce the cost of leveling and ditching streets and alleys, hauling materials, preparing park sites, removing snow, and doing belt work. Write for our booklet on the "Caterpillar"* in municipal service.

The "Caterpillar's" field of usefulness is by no means limited to road making. There is a "Caterpillar"* of size and capacity for every power need. On farm or ranch, in the mining, oil and lumber industries, for snow removal and other civic work—wherever power and endurance are at a premium, the "Caterpillar"* has no real competitor.*

**There is but one "Caterpillar"—Holt builds it. The name was originated by this Company, and is our exclusive trade-mark registered in the U. S. Patent Office and in practically every country of the world.*

CATERPILLAR
Reg. U.S. Pat. Off.

HOLT
PEORIA, ILL.
STOCKTON, CALIF.

THE HOLT MFG. CO., *Inc.*, PEORIA, ILL.

Branches and service stations all over the world

Eastern Division: 50 Church Street, New York

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St. Louis, Missouri
Chicago, Illinois
Holt Company of Texas, Dallas, Texas
Des Moines, Iowa
Minneapolis, Minnesota
Indianapolis, Indiana
Canadian Holt Company, Ltd., Montreal, P. Q., Canada

These prospect lists were card-indexed on colored cards.

Six telephones were installed in the Chamber of Commerce, and a corps of workers kept them in operation throughout the day, and sometimes during the evening, calling the present stockholders of the Building and Loan Associations, inviting them to increase their subscriptions. In this manner over $100,000 was subscribed.

We are sorry that we have not copies of all of the news items and the several ads for distribution. The local Building and Loan Associations, however, are in a position to provide the information used in preparing copy.

Our campaign was enthusiastically received, and many men worked who do not ordinarily work in the regular campaigns known to all cities. The total cost of the campaign was about $1,500.

We recommend this idea to all cities for serious consideration, especially where a housing shortage exists.

H. A. BLISS,
Managing Secretary, Aurora Chamber of Commerce.

Financing Repairs to Buildings

NEWPORT, R. I.—As a means of stimulating employment of labor and at the same time providing for property owners a means of financing repairs to homes, business property, etc., a most commendable plan has been devised by the Newport Chamber of Commerce in cooperation with the bankers and contractors of the city and surrounding community. The plan is a simple one, by which the banks pay to the contractor the cost of the repairs on the completion of the job, and take as security serial notes signed by the property owner and endorsed by the contractor. This enables the home owner to make payment to the bank in small installments, as he receives his money in wages, rent or otherwise. The plan has stimulated a great amount of business for contractors in Newport during a time of severe depression, and it has given such general satisfaction that it will be continued throughout the year.

People took advantage of similar plans for purchasing automobiles, player-pianos and other luxuries during the spending orgy through which the country has passed, and many in our community are now taking advantage of this same plan to finance repairs to homes, etc., that in the meantime have been sadly neglected. The conditions are these:

1. The property owner pays 20 per cent down when the work is completed.
2. For the balance a series of eight notes or less, if the owner may elect, of equal amounts, signed by the property owner and endorsed by the contractor, will be accepted by the bank. These notes shall be due and payable in 30, 60 and 90 days, etc., until all are paid.
3. Further conditions:
   (a) These notes are not renewable; they must be paid when due.
   (b) The minimum amount of any single note will be $25.
   (c) The rate of interest will be 6 per cent, payable at maturity of each note.
   (d) The minimum interest charge on any note will be 25 cents.

HOW IT WILL WORK

Supposed repairs to cost	$500.00
Cash	100.00
30-day note	50.25
60-day note	50.50
90-day note	50.75
4-months' note	51.00
5-months' note	51.25
6-months' note	51.50
7-months' note	51.75
8-months' note	52.00
Total cost	$509.00
Contractor's bill	500.00
Cost of easy payment plan	$9.00

W. C. CAMPBELL,
Managing Secretary, Newport Chamber of Commerce.

South Bend's Safety Progress

SOUTH BEND, IND.—The South Bend Safety and Fire Prevention Council is securing, in the opinion of the Police Department and others, very unusual results through its Vigilance Committee, which now numbers 150 members. We find that the personal touch that we are able to put into the work has a very satisfying reaction, entirely different from that secured by the Police Department itself when it must use other methods.

During Fire Prevention Week, October 2-9, we distributed questionnaires to be used by the children in the home and returned to the school, which, in turn, filed them with us. This report has given us a comprehensive understanding of the conditions of many homes, and, through the cooperation of the Fire Department, the Chief of which is Chairman of our Fire Prevention Committee, we shall be able to rectify, to a very large degree, conditions found to warrant a hazard.

On one evening, we had the entire Police Department as guests of the Council

For the Winters Snow

TRACTOR SERVICE AT ALL TIMES

MONARCH TRACTORS furnish to the city or to the contractor a powerful hauling unit which pulls graders and other road machines during the road construction season, while during the winter, with equal satisfaction, it opens up snow-bound roads when it is equipped with a locomotive type snow-plow. Ample power, simplicity of construction and accessibility are the inherent qualities of Monarch Industrial Tractors.

Write for our interesting booklet, "Monarch Facts," describing the work of the Monarch Tractor, an efficient all-season machine.

MONARCH TRACTORS, Inc.
Watertown, Wisconsin

And equally good for other Seasons

at dinner, and shifts to meet the change of day and night service. The following week we entertained, in like manner, the entire Fire Department. We believe that this will bring about a better mutual relationship and understanding between the men who actually perform the service and ourselves.

The schools are cooperating with us to the fullest extent, and, on request, the Teachers' Federation has affiliated with the South Bend Chamber of Commerce and has a committee working with us in the Federation. Our plans contemplate the inaugurating of a Foremen's School which will embrace the foremen of the various plants of the city. In addition to this, we are erecting bulletin boards throughout the city with safety posters changed each week. These boards are of all-metal construction and permanent in character.

We feel that we are performing a service to the community that will react to its safety.

FRANK J. GREEN,
Secretary-Manager, South Bend Chamber of Commerce.

City Limits Extended

COLUMBUS, GA.—The Chamber of Commerce has just secured legislation calling for an election to extend its city limits, this act virtually assuring an expansion program which will take in 10,000 good citizens, who for years have had every interest in the city, and whose homes are now on the edge of the city limits. The movement grew out of suggestions from group meetings and by mail that expansion should be one of the Chamber's major projects for the year. Numerous meetings were held to harmonize all interests and to acquaint the legislators with reasons for annexing the territory. The annexation election will be held this fall, and as only a majority of the combined vote of those in the city and those in the territory affected is needed, there is little doubt that the territory will be voted in.

S. A. SPIVEY,
Secretary, Columbus Chamber of Commerce.

Chamber Cultivates Civic Organizations

SIOUX FALLS, S. DAK.—By its cooperative and friendly attitude, the Sioux Falls Chamber of Commerce has developed a very fine spirit among the civic organizations of the city. Recently the Board of Directors of the Chamber were hosts at a dinner given to the presidents, secretaries, and chairmen of the public affairs committees of the Rotary, Kiwanis, Booster and Lions Clubs at the Chamber's dining-room. The single purpose of the dinner was to strengthen the bonds of friendship between the organizations. The program included a series of brief talks by officers of the clubs represented, designed to show what could be accomplished for Sioux Falls through close cooperation. It is now the settled policy of the Chamber to call for a committee from each of these brother organizations to discuss problems of city-wide importance as they are presented to the Chamber for solution.

CHARLES McCAFFREE,
Secretary, Sioux Falls Chamber of Commerce.

More Paving for Walsenburg

WALSENBURG, COLO.—One of the biggest projects yet undertaken by the Chamber of Commerce culminated successfully with the letting of contracts for the construction of approximately 40,000 square yards of bitulithic pavement, at a cost of $130,000. A large section of the business district and part of the near-by residential area will be benefited.

CHARLES O. UNFUG,
Secretary, Walsenburg Chamber of Commerce.

Bond Issues for City Improvements

SANFORD, FLA.—The Sanford Chamber of Commerce was responsible recently for carrying through a $625,000 bond issue for municipal improvements. Provision was included in this for paving an additional 10 miles of streets, the cost of which will be $468,000. There is also an item of $67,000 for the construction of a yacht basin on the lake front. Extensions and improvements to the present sewerage system will amount to $40,000, which was also provided for in the budget, as well as a public library building to cost $15,000. The amount of $35,000 is set aside for the retirement of outstanding city warrants.

The Chamber of Commerce also handled the publicity which made successful the carrying of a county bond issue in the amount of $100,000 for maintenance of roads. The organization is active in preparing plans which will eventually mean the municipal ownership of the public utilities of Sanford.

R. W. PEARMAN, Jr.,
Executive Secretary, Sanford Chamber of Commerce.

One of a fleet of Baker Auto Truck Snow Plows which keeps Salt Lake City streets clear of snow.

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The Dependable Snow Movers

There's a feeling of security in knowing that you have dependable snow moving equipment at hand. Baker Snow Plows are known for their dependability. They are built for the tough job of snow moving whether with motor trucks, tractors or horses. Each type of plow is designed by experienced engineers and adopted only after exhaustive tests.

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Universal Attachments to Standard Motor Trucks

The installation of Baker Auto Truck Snow Plows means protection against traffic tie-ups. In every nook of the Snow Belt you will find counties with fleets of them. The largest cities are using them. It's the same story everywhere—they are giving satisfaction because they stand up to the job. They do the work better. They can be attached quickly to any standard truck. They are equipped with numerous devices for safety and convenience such as Safety Tripping Blades, self-locking lifting device and adjustable supporting shoes.

Can your City, your County or your business afford to be without snow protection?

Baker Snow Plows are the best Snow Insurance.

Patent Safety Tripping Blades

Every straight blade Baker Snow Plow is equipped with the Baker Patent Safety Tripping Blades hinged to the bottom of the plow which trip back when striking man-holes, car tracks, etc. Specified by the City of New York on recent large purchases of snow plows. Insist on this protection.

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The BAKER Mfg. Co.
503 Stanford Ave.
Springfield, Illinois

Designing and Equipping the School Cafeteria—Part II

By A. E. Merrill

The Kitchen

ALTHOUGH first consideration has been given to the counter and the dining-room, no less important is the kitchen. It is here, too, that the greatest errors have been made. The most common mistake is a space too cramped and equipment too meager. One large open kitchen facilitates the work and prevents loafing. Ample range and oven space is essential, and when steam of 15 pounds pressure can be obtained, a vegetable steamer and jacket kettle should be included. If this is possible, two large hotel ranges and a portable bake-oven are sufficient for each counter service. If not, at least three ranges and one oven are necessary. Bread and rolls are very seldom baked, as the local baker can supply them at a lower cost; the oven is used for pies, cakes, puddings and potpie dishes.

The ranges are generally selected for gas if it is available. They should be of one of two types, either provided with concentric ring burners or a series of water heater burners across the front which throw the flame from front to back. In either instance, the top should be of polished steel plates, to furnish a smooth, evenly heated top for pots and pans. Ovens should be insulated, heated by bar burners with pilot light attachment. The doors should be self-closing, insulated and thoroughly braced. The bake-oven may be either of the cabinet variety, built in one unit with galvanized insulated walls and metal shelves, or of the portable type which comes in sections and is provided with tile shelves. Gas is the most satisfactory and cleanly fuel for either of the above types. If expense is not a consideration, the electric oven is most satisfactory and gives an even, easily adjusted temperature for any purpose which is desired.

In general, ranges, bake-oven, kettle and steamer are lined up on the wall of the kitchen opposite the dining-room partition. A canopy 4 feet wide and at least 24 inches in depth is hung over them. The kettle and steamer are placed in a drip-pan to catch all condensation and also to allow them to be easily flushed out after each use. A swinging arm faucet hung over them furnishes the water-supply. Kettles may be of cast iron, retinned copper or aluminum. A hinged cover and a large faucet should be required on each kettle.

VIEW OF THE SERVICE COUNTER OF THE H. R. PATTENGILL JUNIOR HIGH SCHOOL, LANSING, MICH.

The steamer should be made in one-piece single, double or triple sections, and fitted with adjustable swinging doors on each section. These doors when closed automatically turn on the steam; when opened, the steam is shut off and the steaming baskets are brought out of the steam on a roller carriage. This eliminates all possibility of a scalded operator or serious burns from reaching into the steamer after the baskets.

In front of the line of ranges the cooks' tables and bakers' table should be arranged. Each should be of selected sectional maple, tongued, glued and rodded together, mounted upon iron stands fitted with metal drawers and shelves. The bakers' table is also provided with metal tilting bins. A mixing-bowl and hot plate complete the special equipment for the baker in this size kitchen.

Snow means a lot of fun for the children, but a big snow storm is an altogether different proposition for the grown-ups whose business it is to keep roads and streets open for travel.

There was a time—not long since—when the cost of moving snow from public highways by hand labor, the only method then known, was practically prohibitive. To-day a snow storm need not be a nightmare to road and street officials, because the Champion Snow Plow, attached to a motor truck or tractor, will quickly and easily clear snow from highways at small expense.

The Champion Snow Plow which has successfully met the test of of time and service, can be readily attached to any standard make of truck or tractor. It consists of a steel scraper blade which is hung on a semi-circular steel frame, providing angular adjustment, permitting either right or left hand cutting.

The Champion Plow will save its initial cost after one snow storm. It is used and endorsed by town, county, city and state highway departments. No municipality within the snow belt can afford to be without one or more of these plows.

An informing catalog will be sent free to anyone who asks for it.

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It is, however, necessary to provide an ice-box, a sink, and a mixing-machine to be used by the baker and others, and all these should be placed as near the oven as practical.

The mixing-machine is of utmost importance, as it is used by the baker for mixing cake dough and mayonnaise or whipping cream. It is of greatest service for beating potatoes and should be selected with 80- and 30-quart bowls. At least two beaters, two whips, one dough hook and a puree brush are the needed attachments. A convenient location is at the end of the cooks' table next to the baker.

in the center, and a storage chamber fitted with shelves surrounds this on both sides and below. These boxes are substantially made and may be used either with ice or an ice machine. Thinner walled boxes waste quantities of ice and will not hold any low temperature in a hot kitchen. The original difference in cost is quickly consumed in excessive ice bills and wasted food.

Sinks are necessary for pot washing, vegetable cleaning and glass and silver washing, and should be made of galvanized iron of at least 14-gage. A good general size is 24 x 24 x 14, or 16 inches in depth. The edges of the sinks should be rolled over

THIS SERVICE COUNTER IN THE JACKSONVILLE HIGH SCHOOL SERVES APPETIZING FOODS QUICKLY AND WITH ECONOMY

A general improvement is noticeable in the construction of stock service refrigerators of all makes, and it is possible to select all the boxes needed in the average school cafeteria from those carried in stock by leading concerns.

The larger of the two ice boxes for the kitchen should be provided with an overhead ice bunker and one walk-in compartment fitted with meat racks and shelves. One large entrance door with a self-closing catch and heavy conduit fastener opens into this room. The other compartment may be filled with four service doors opening into a space supplied with shelves, the smallest of these boxes with six doors. The ice chamber is

to prevent any sharp edges, and the backs extended up to 12 inches for a splash-back. At least one 24- or 30-inch drain board should be supplied for each sink.

At the end of the cooks' table an open steam table or bain-marie is provided to keep vegetables hot and ready to serve after being prepared. This is made with a copper pan stretched over 10-gage steel and mounted upon an angle-iron stand fitted with one shelf. A false bottom is provided over the coils or gas burners, and stone or china jars are used for containers. Over the cooks' table is hung a heavy iron bar saucepan rack upon which all heavy cooking utensils are hung. This is made of band

At left: Washington Heights, maintained with "Tarvia-B" since 1916.

"Tarvia-B" makes good in Newburgh—

Benkard Avenue, pictured in the circle, was the first Tarvia street in the City of Newburgh, New York. The results were so satisfactory that in 1916 other macadam streets were given their initial Tarvia treatments. Not until last year, however, when the 18 miles of roadway shown on the accompanying street map were surfaced-treated with "Tarvia-B", was the use of all other kinds of road-maintenance materials entirely abandoned in favor of Tarvia.

Mr. W. J. McKay, City Manager, wrote under date of March 17, 1922:

> "It is with a great deal of pleasure that I inform you that the results obtained from the use of your 'Tarvia-B' on the streets of this city last season were more than satisfactory.
>
> "While we are always in the market for material cheaper than the material we used the preceding season, it would take a considerable difference in price to have us make any change in the product to be used for the season of 1922."

Economy must be the goal of every conscientious public official. And the officials of Newburgh, and hundreds of other cities and towns throughout the country, have found from experience that Tarvia is the most economical of all road materials.

Above: Du Bois Street, maintained with "Tarvia-B" since 1916.

Below: Benkard Ave., maintained with "Tarvia-B" since 1913.

Tarvia

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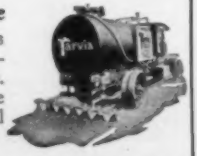
Tarvia is made in various grades for all road purposes—new construction, repairs and maintenance. An illustrated booklet telling of the different Tarvia treatments will gladly be sent free, on request.



New York, Chicago, Philadelphia, Boston, Detroit, New Orleans, Birmingham, Kansas City, Peoria, Atlanta, Duluth, Milwaukee, Youngstown, Toledo, Columbus, Richmond, Baltimore, Omaha, Jacksonville, Houston, St. Louis, Cleveland, Cincinnati, Pittsburgh, Minneapolis, Dallas, Syracuse, Salt Lake City, Bangor, Washington, Johnstown, Lebanon, Latrobe, Bethlehem, Elizabeth, Buffalo, Denver, San Francisco

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iron and supplied with three rows of large hooks.

Near the large refrigerator should be furnished a sectional maple cutting-bench and chopping-block. An average size for these is 48 x 30 inches for the bench and 24 x 24 inches for the block. One of the most convenient and serviceable machines that should be included in every equipment is a Buffalo chopper. This consists of a slowly rotating steel bowl in which two knives rapidly revolve. It is used for finely chopping raw or cooked meats and vegetables and does it without mashing them.

Tables and a slide are provided on the wall separating the kitchen from the counter. If only one slide is used, this should be back of the pastry counter. All cutting of bread, pastry and cakes should be done in the kitchen and passed through these slides to the counter. Here, too, the preparation of salads and serving of puddings, etc., into individual dishes is done. The service ice-box and a sink should be conveniently located near these tables. If possible, the sectional maple construction should be maintained for all kitchen tables.

The vegetable preparation should include, in addition to a maple table and a two-compartment sink, a vegetable peeler. One of these machines will soon pay for itself in saving of labor and potatoes. They come in various sizes, the 30-pound size being best suited to the single service unit.

The dishwashing pantry is the last to be considered, but by no means is it of least importance. Probably more money and thought have been expended in developing dishwashing machinery than in perfecting any other kitchen appliance. This has largely been due to the constantly increasing difficulty of securing the class of help which will perform this disagreeable task, and secondly to the demand for better and more sanitary dish washing.

The original machines were square or round tanks provided with a propeller at the side or bottom of the tank. This propeller was rapidly rotated, causing a violent whirlpool motion in the tanks, which cleansed dishes packed in wire baskets and immersed in the tanks. The more modern and sanitary method is to stack the dishes in trays which are pushed along on tracks over the tanks. A centrifugal pump or a mill-wheel propeller throws the water from the tanks over and over on the dishes. A final rinsing spray of hot water cleanses the dish of the wash water. A dishwashing machine is absolutely essential both as a labor-saver and a means of reducing dish and glass breakage.

As important as the dishwashing machine itself is the set of tables which surrounds it. The tables may be of 14-gage galvanized iron and built in the shape of a shallow sink 4 inches deep with sloping sides mounted on 1¼-inch iron pipe standards and pitched to drain into the sinks and dish washer. The soiled end of the table should be provided with a 6-inch hole and a rubber-bound scraping block. Adjacent to it and built into the table there should be a two-compartment silver and glass sink measuring 36 x 18 x 12 inches. Over this as well as over the clean dish table may be placed an elevated metal shelf for stacking the glasses and silver when cleaned.

Adequate provision for hot water supply should be made for any dishwasher, as it will not operate properly with lukewarm or cold water. A 250-gallon tank for the dishwasher alone is none too large for a cafeteria serving 1,000 meals at noon. If hot water is plentiful, the dishes come out of the machine so hot that they will air-dry in a few minutes, so that no wiping is necessary. The dish pantry should be located adjacent to a door or slide leading to the dining-room, and an aisle in the dining-room should be provided for carrying the soiled dishes to this pantry.

It is not the purpose of this article to discuss the small equipment necessary, such as china, silver, glassware, linens, small kitchen goods, etc. Some suggestions, however, are advisable. Aluminum trays 14 x 18 inches are most practical. Silver should be at least 12 pennyweight on a nickel silver base, and china with a hard vitrified body and of hotel weight should be selected. Each table requires a sugar bowl, salt and pepper shakers and a vinegar cruet. Paper or butcher linen napkins should be provided at the counter.

An elastic composition tile floor is the best. Ventilation must be thorough and complete, and the more natural light and air that can be secured, the better.

As before stated, the complete single service unit here described has a capacity of

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are made in various sizes and different lengths to meet every need. No. E-751 (patent applied for) here shown, is for use with Round Way Minneapolis Curb Cocks. Other patterns for other Cocks.

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fit both new and old style Buffalo Service Boxes and provide a means for supplying a new lid to any box, regardless of condition of box top. An old box with a new MUELLER Lid (E-850, patented,) is a better box than when new.

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about 200 every 15 minutes. If it is impossible to serve the pupils in shifts, it is well to add a second service if the number desiring meals at one time is liable to be 300 or over. This is easily done by a second counter, which is a duplicate of the first and can be arranged with reference to the kitchen in a horseshoe or, if the room permits, paralleling the kitchen walls. The students come from both sides of the room toward the center, where a double battery of urns does duty for both counters. Any multiple of this service can be arranged; as many as six double horseshoe units, twelve services in all, are used successfully in commercial or industrial installations.

The points to be watched particularly are: first, that simplicity should be the keynote; second, the equipment should be determined on the basis of the ultimate capacity of the school rather than its enrollment at the start; third, sufficient equipment to reduce labor should be provided; fourth, equipment should be of standard, sanitary construction, chosen for durability and long life.

ACKNOWLEDGMENT.—Illustrations by courtesy of Albert Pick & Company.

Non-Combustible Construction Protects School Buildings

A Few Records of Schools That Were Saved Through Proper Construction

STORIES of instances where fire-resistive construction has saved school buildings from destruction by burning do not often get into the newspapers, for the reason that only the spectacular fires involving serious losses are considered as having news value. The Grand Rapids, Mich., *Press,* however, saw the news value of the statement made by the President of the Board of Education to the effect that reinforced concrete construction saved a school building in that city. He stated that the fire in the Coit School would have destroyed the entire building if it had originated in the old part instead of the new building. The blaze, which was caused by spontaneous combustion of mops which had been dipped in linseed oil and which the janitor had neglected to destroy, burned a hole of considerable size in the wooden floor, destroying some of the timbers and plaster beneath, and then put itself out when it reached the concrete base.

On October 28, 1921, in the Horticultural Building at the Pennsylvania State College, a fire broke out in the attic, which because of a shortage of space had been converted into a laboratory. The roof of the building was of wood construction, but the three main floors, as well as the attic floor, were of reinforced concrete. The firemen could offer but little resistance, since the water pressure was entirely inadequate. The contents of the laboratory and the roof of the building were destroyed. The reinforced concrete floors prevented the spread of the flames to the lower parts of the building. In the reports of the fire it was stated that there was no damage to the $200,000 building below the level of the attic floor, and the damage to the roof, the attic and the contents of the laboratory amounted to about $35,000; whereas, had the building been of combustible construction, it would in all probability have been completely destroyed, owing to the weakness of the water pressure.

Several months ago a fire broke out in the Byron Stolp grade school in Wilmette, Ill., a suburb of Chicago. The fire started in the boiler room, that prolific source of school fires. The wooden floor of the classroom immediately above the boiler room crashed into the basement, but the ceiling of this room, which was protected by portland cement plaster on metal lath, prevented the fire from breaking through the second floor.

Two of the walls of this classroom are outside walls, another wall is of heavy fireproof partition, and the fourth is a fireproof corridor wall. The door from the classroom into the corridor was not self-closing, but happened to be closed at the time of the fire, which occurred on a Sunday morning. Not the slightest damage was

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caused outside the boiler room and the single classroom. Had the floors of this building been of thoroughly fire-proof construction, the fire could not have spread beyond the boiler room, and the loss would have been practically nothing.

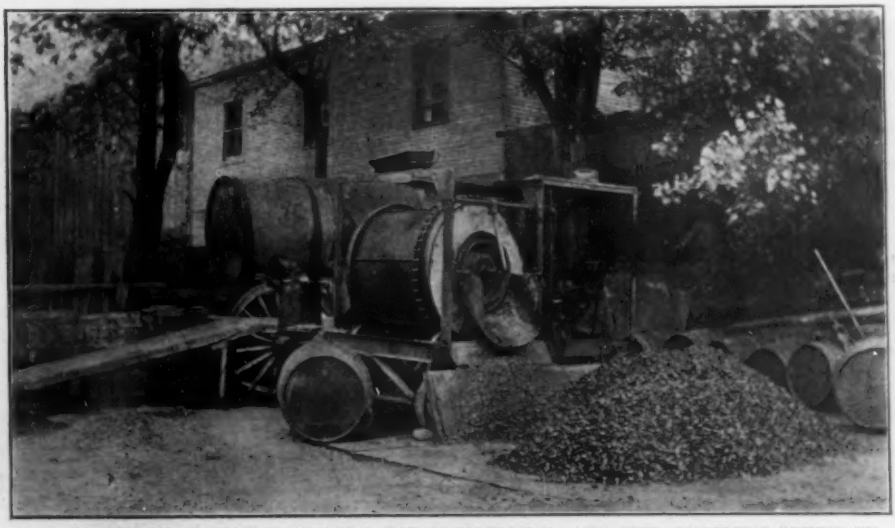
The National Fire Protection Association issued a four-page printed leaflet some time ago, illustrating and describing the fire in the high school at Arlington, Mass., on July 18, 1921. This fire resulted in a damage of about $25,000. The building was well constructed, as school buildings go, and was resistive to a fairly high degree, but several weak points, which would probably not have cost more than $3,000 to correct, permitted the spread of the fire to various parts of the building and resulted in considerable damage. In this instance failure to take the final step toward fire-resistive construction permitted the moderate damage which occurred.

Buildings that refuse to burn down are a good public investment. This was well shown in Boonville, N. Y., where the high school was destroyed early in February of this year. The building was built in 1910 at a cost of $45,000. It had a combustible interior with exterior walls of masonry, a type of construction very commonly used in school buildings in this country. This entire interior was destroyed, and most of the exterior walls fell in. Destruction was complete. The value of the building, based on replacement cost, was estimated at somewhere between $80,000 and $100,000. Insurance was only $17,000, and the town still owes $10,000 on the destroyed building.

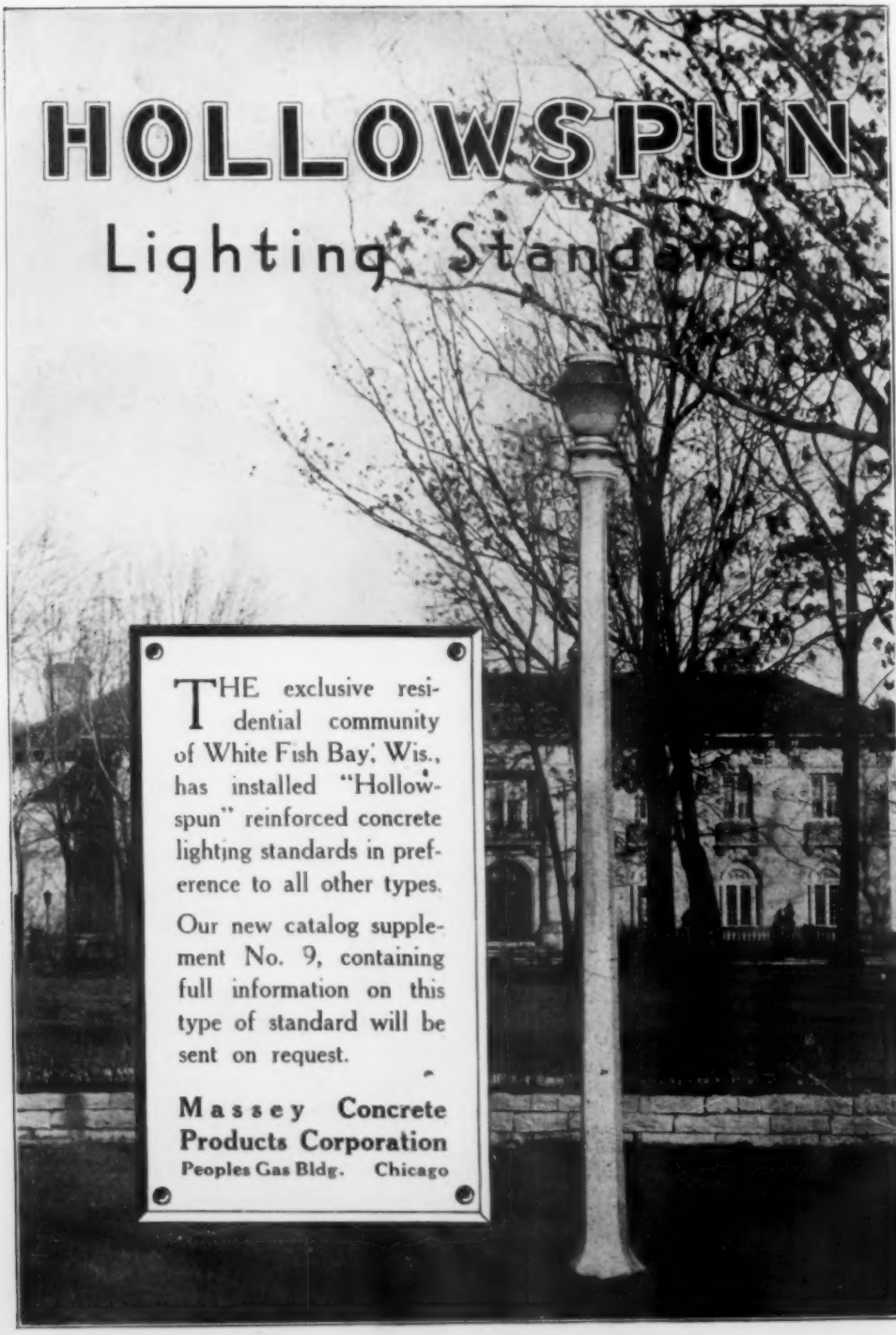
The Cold Patch Method of Maintaining Roads

Maintenance of Asphaltic and Concrete Roads Facilitated by New Material

OFFICIALS in charge of the construction and maintenance of our roads and streets have come to appreciate the tremendous importance of proper maintenance. Various methods for pavement up-keep have been developed. Among them is the cold patch method, which is being employed quite extensively throughout the United States, using bituminous materials developed by several different companies.



A FRESHLY MIXED BATCH OF COLD PATCH MATERIAL, AND THE CONCRETE MIXER IN WHICH THE MATERIAL IS PREPARED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Our new catalog supplement No. 9, containing full information on this type of standard will be sent on request.
Massey Concrete Products Corporation
Peoples Gas Bldg. Chicago

Cold patch material contains an asphalt which is of the consistency of solid asphalt. For convenience in using, the asphalt is cut back with light volatile oil, which serves to thin it to the consistency of a liquid, so that it may be mixed cold and used without requiring the application of heat. After being exposed to the air for some time, the volatile matter evaporates, leaving the solid asphalt as a binder.

This material is mixed in certain definite proportions with stone screenings or a combination of screenings and sand, and the mixture is allowed to stand for several days until the thinning agent has evaporated and the batch has become thick enough to handle. The practice is to store several days' production in separate piles, so that a completely cured batch is ready for use each day. Mixing may be done in a small concrete mixer, although hand mixing may be employed when a mechanical mixer is not available. When a concrete mixer is used, the required amount of mineral aggregate is placed in the skip, and the necessary quantity of the binder added, followed by the rest of the stone. It takes from two to three minutes to thoroughly coat the stone. When the mixing is done by hand, the batch should be turned over until a homogeneous mixture is obtained.

Of first importance in the preparation of a batch of patching material is the employment of the proper amount of binder and stone, and, when it is used, of sand.

The town of Englewood, N. J., which has used Texaco cold patch, employs approximately 18 gallons of binder to the cubic yard of mineral aggregate, consisting of equal parts of ¾-inch and ½-inch stone screenings. This town has patched a number of its roads, using this mix, and has had very gratifying results. South Orange, in northern New Jersey, uses a different mix with equally satisfactory results. To every four wheelbarrow loads of ¾-inch stone are added 4 gallons of binder and 7 shovels of sand.

To secure the best possible patch, the area to be treated should be entirely free from moisture. All loose material should be removed from the hole or worn spot in the road, and the sides of the hole cut vertically to the bottom with an axe. This lessens the possibility of the creeping or shoving of the patch under traffic. The patching material is shoveled into the hole and raked out. A sufficient amount of material is used to give a patch which stands slightly above the rest of the pavement after it has been tamped and rolled. Traffic very quickly reduces it to the same level as the surrounding surface.

In patching holes having a greater depth than 3 inches, larger broken stone, preferably coated with the binding material, should be filled into the hole and tamped, bringing the bottom of the hole to within two or three inches of the surface. The patching material is then added in the regular manner. While it is not generally essential when coarse stone is used in the mix, it is advisable to give the completed patch a paint coat of the binder and to spread screenings free from dust over the repaired area and then roll.

A patch laid in the manner outlined above, with the proper materials, will be found to be water-proof, resilient and adhesive. The method and materials may be used in patching any type of road, from water-bound macadam to the higher forms of bituminous construction, as well as brick and block types and cement concrete.

If the roads of our towns and cities are periodically inspected and weaknesses and disintegrations treated promptly with cold patch or a similar material, a great deal of money will be saved which may be devoted to the extension of our present highway systems.

Pennsylvania's Road Mileage

There are 10,777 miles of state highways in Pennsylvania. Of these, 5,378.87 miles are earth roads, 190.2 are gravel, 155.7 are of flint, 2,089.5 are water-bound macadam with broken stone base, 828.3 are water-bound macadam with telford base, 218 miles are of bituminous macadam, and 115 miles are of bituminous concrete. There are 68.16 miles of bituminous concrete with telford base, 58.4 of asphalt with broken stone base, 70 miles of plain concrete, and 1,086 miles of reinforced concrete. The mileage of vitrified block roads is 383 miles, of the wood block 3.7, and of the stone block 4.5 miles.

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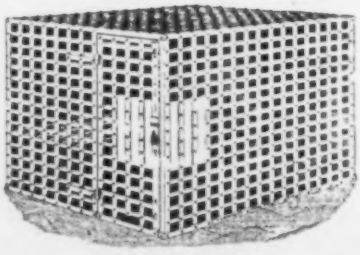

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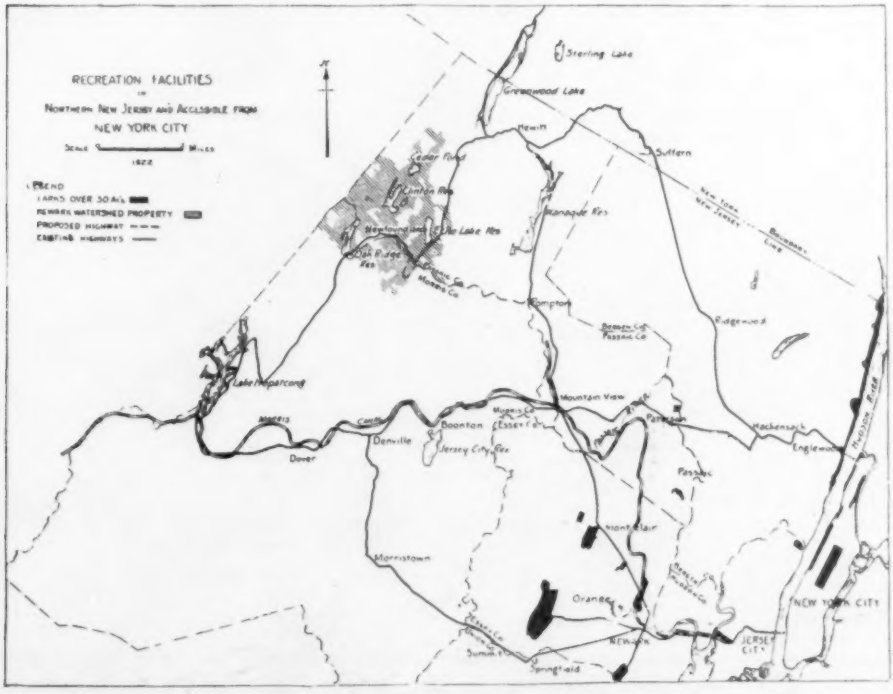
The Morris Canal and New Jersey's Opportunity

By Harold M. Lewis

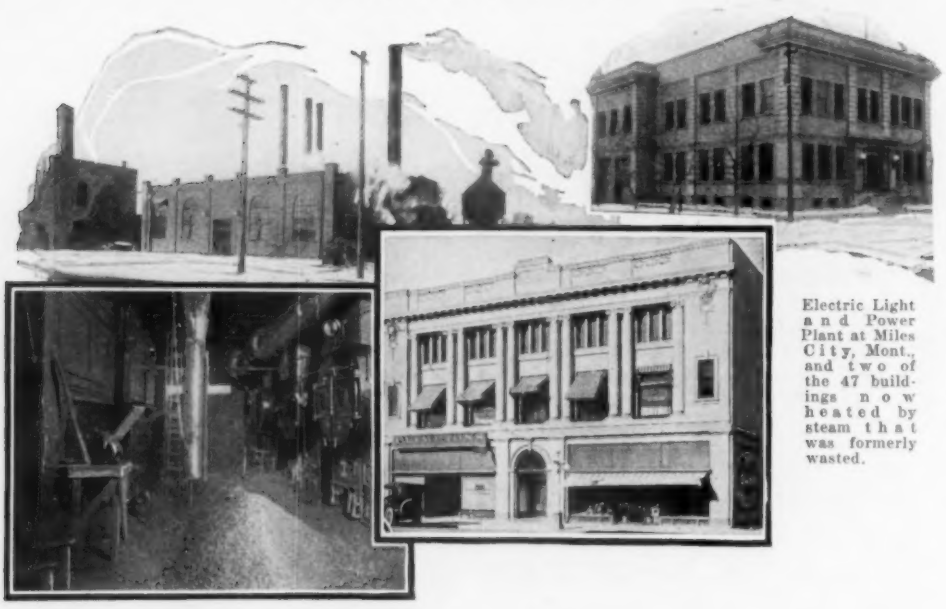
Of the Physical Survey, Plan of New York and Its Environs

THAT part of northern New Jersey included in the studies being made by the Committee on a Plan of New York and Its Environs had in 1920 a population of 2,346,851. More than three-quarters of these people live in that part of the state shown in the accompanying drawing. Winding through the business, residential and rural districts is the route of the Morris Canal, which has ceased to be a commercial waterway of any importance. The physical survey being made by the Committee points out the opportunity which the people of New Jersey have to turn this practically abandoned ditch into an unusual public asset.

Chartered in 1824 for 99 years, the original grant provides that at the end of this period, which is on December 31, 1923, the state may acquire the canal and all its rights by paying a fair value. If this right is not exercised within a year from that date, the charter is automatically renewed for 50 years, at the expiration of which period the canal and its appurtenances would revert to the state. In 1871 the State Legislature authorized a lease of the Morris Canal property to the Lehigh Valley Railroad, and there is some doubt as to how this lease would affect the recapture by the state. The company is desirous of maintaining for railroad purposes the two ends



NORTHEAST CORNER OF NEW JERSEY, SHOWING THE ROUTE OF THE MORRIS AND ESSEX CANAL AND THE MANY COMMUNITIES IT TOUCHES



Electric Light and Power Plant at Miles City, Mont., and two of the 47 buildings now heated by steam that was formerly wasted.

Waste Steam Used for Community Heating

AFTER facts brought out in court showed that Miles City, Montana, was losing more than $100 a day by not selling exhaust steam, permission was given the electric station to proceed with a plan for distributing this waste steam to heat nearby buildings.

A bulletin has been prepared showing the development of this profitable municipal venture. Today, some 47 buildings are heated from the central station plant. Heat sales run over $32,000 a year. Fire hazards are reduced because individual heating plants are thrown out of these buildings. Dirt and dust of coal and ash handling are eliminated. This is one of over four hundred installations of Community Heating designed and installed by our engineers.

If there is an electric light plant or factory in **your** city wasting steam, why not use it to heat nearby buildings? Buy your steam heat as you buy gas or electricity—by meter!

Write for Bulletin No. 20-AC covering Adsco Community Heating of a group of buildings from Central Station Steam Plant. Bulletin No. 158-AC covers Adsco Heating for individual buildings. Architects, engineers and heating dealers should also ask for Bulletin No. 159-AC.

AMERICAN DISTRICT STEAM COMPANY

GENERAL OFFICES AND WORKS

NORTH TONAWANDA, N.Y.

OFFICES:

New York Chicago Seattle St. Paul

ADSCO HEATING

of the line, that (not shown on the drawing) in Hudson County, and that in Phillipsburg on the Delaware River, and is understood to be willing to turn over the rest of the property, with all the shares, stocks, bonds and scrip which it owns, to the state, which should, however, condemn the outstanding stock, about 680 shares.

The final use of the canal property has already been discussed by three State Commissions, known as those of 1903, 1911 and 1912. The Board of Engineers of the Jersey City Development Plan and the Port of New York Authority have recommended that the portion of the canal in Hudson County be converted into a motor truck highway. The remainder of it seems to offer the most advantages if used for recreational and park purposes.

Essex and Hudson Counties have accomplished much toward building up comprehensive park systems, but these should be expanded into other counties and linked together in a unified whole. What could be a more useful part of this enlarged system than a continuous strip of publicly owned property developed with one or two well-constructed driveways bordering a waterway excellently adapted to canoeing, boating, and, at certain points, to bathing? In the metropolitan area alone it would link up with the congested areas such beauty-spots as Lake Hopatcong and the hills of Morris County. Already existing roads lead from it to the large areas on the Pequannock River owned by the city of Newark for water-supply purposes, the natural beauty of which will thereby be preserved and enhanced, while these same roads, skirting the new Wanaque reservoir and Greenwood Lake, extend to the immense pleasure grounds of the Palisades Interstate Park Commission and reach the Hudson at Bear Mountain.

At the more densely populated communities through which the canal passes, such as Newark, Bloomfield and Paterson, excellent opportunities would be offered for the expansion of the parkway into larger local parks. By an ultimate development of the western part of the canal along similar lines, there would result an automobile route leading to the Delaware River and the West that would rival any similar highway in existence. Its certain popularity can hardly be questioned, and the increased values along its borders would be an immense financial gain to the state and the local communities.

This great metropolitan district must plan for the future. Is it not more reasonable to act now than to allow the whole question of the disposition of the Morris Canal to lapse for another fifty years?

Thomas Adams to Spend Several Months in America

THOMAS ADAMS, of England and America, is coming to Boston early in January as Lecturer on Civic Design to the Massachusetts Institute of Technology. In addition to conducting this course, Mr. Adams expects to be available for occasional lectures and consultation on city and regional planning in other American communities during at least the first four months of 1923. To carry on his work in England, Mr. Adams has entered into partnership with Longstreth Thompson, B.Sc., Municipal Engineer and Architect. The firm will practise as town planning consultants and will work in close collaboration with Thomas H. Mawson & Sons, architects and landscape architects, of Lancaster, England.

On the Calendar of Conventions

NOVEMBER 14-16.—KANSAS CITY, MO.
City Managers' Association. Annual convention. Secretary, Paul R. Wilcox, City Hall, East Cleveland, Ohio.

NOVEMBER 23-25.—PHILADELPHIA, PA.
National Association of Civic Secretaries. Annual convention. Secretary, Francis T. Hayes, City Club, Hollenden Hotel, Cleveland, Ohio.

NOVEMBER 23-25.—PHILADELPHIA, PA.
National Municipal League. Annual meeting. Secretary, H. W. Dodds, 261 Broadway, New York, N. Y.

DECEMBER 1-2.—LAKEWOOD, N. J.
New Jersey Sanitary Association. Annual meeting. Secretary, Edward Guion, Bureau of Health, City Hall, Atlantic City, N. J.

DECEMBER 4-7.—KANSAS CITY, MO.
American Association of State Highway Officials. Annual meeting. Secretary, C. M. Upham, State Highway Engineer, Raleigh, N. C.

DECEMBER 7-8.—WASHINGTON, D. C.
National Civil Service Reform League. Annual meeting. Secretary, H. W. Marsh, 8 West 40th Street, New York, N. Y.

JANUARY 15-19.—CHICAGO, ILL.
American Road Builders' Association. Annual convention. Secretary, E. L. Powers, Editor "Good Roads," 11 Waverly Place, New York, N. Y.

Over a year of night and day running in Altoona, without a break.

Giving *Continuous* Service in Altoona

CITY OF ALTOONA
Pennsylvania

Sept. 21, 1922.

Mr. Charles F. Carpenter
Secretary Altoona Garford Co.,
City.

Dear Sir:

Replying to your letter of the 16th inst., asking information relative to the Garford Chassis, and Studebaker Flusher to the Garford Chassis, and 1921, by the City of Altoona.

I am glad to say that, both the Flusher and Chassis are giving good satisfaction, after over a years continuous service, they are both in excellent condition.

By continuous service, I mean twenty-four hours a day, for that period of time one year and a half, in fact the only fault we find, is not with the Chassis or Flusher but with the City of Altoona, we would like to add "S" to the word Flusher.

I take great pleasure in recommending the Garford Chassis and Studebaker Flusher, to any Municipality for efficiency and economy in street cleaning.

Your fairness in the adjustment, is only more proof that the Flusher is all you claim for it.

Yours truly,
BENCE KEATLEY
Commissioner of Streets & Public Improvements.

A model 68-D GARFORD TRUCK carrying a flusher, has made an enviable record in *continuous-night-and-day* running in Altoona, Pa. Two years service in one—under all kinds of weather and climatic conditions, this GARFORD is showing the customary dependability for which they are known.

Read what Mr. Bence Keatley, Commissioner of of Streets and Public Improvements says in his letter.

The Garford Motor Truck Company, Lima, Ohio

Manufacturers of 1, 1½, 2½, 4, 5, and 7½ Ton Trucks

GARFORD

DEPENDABLE TRANSPORTATION

It will interest you to know that —

Michiganders Like Matrimony

Eleven out of every 13 married persons in Michigan are contented with matrimony, judging from the 1921 divorce and marriage records compiled by the State Department of Health. Two out of every 13 contemplate annulment of their marriages.

These ratios are based on 41,508 marriage and approximately 7,632 divorce records recorded in the state in 1921. In 1920 there were 50,805 marriages and 8,679 divorces. The 1918 and 1919 ratios of one court ending to every six matrimonial ventures increased during 1920 to one divorce to every 5.9 couples married, and last year to one divorce to every 5.5 marriages.

Buenos Aires Cops Welcome Strangers

The city of Buenos Aires, Argentine, maintains a police corps known as "First Aid to Foreigners." These men are police interpreters assigned to railroad stations, landing places and public buildings, as well as other places frequented by foreigners. Each man wears on his left sleeve a badge with the flag of the nation whose language he speaks. This system is well known to tourists in some European countries, particularly Germany, where the same system proves very helpful to the foreign traveller.

Fire Prevention Inspectors in New York Have Organized

Ten years ago few would have dreamed that there could be in any American city an organization of fire prevention inspectors, but such has recently come about in New York City, where the men in the Bureau of Fire Prevention, feeling the need for closer cooperation among themselves, have organized the New York City Fire Prevention Inspectors Association. The purposes of the Association are to advance the science and practice of fire prevention by educating the public and establishing effective relations between the Bureau of Fire Prevention and the property owner; to provide a closer and more practical cooperation between the various inspectional departments of the city and state in the matter of fire prevention; and to recommend and assist in promoting and simplifying legislation for the purpose of preventing the destruction of life and property by fire.

Referenda Sometimes Fail to Register

On the ground that no one can tell whether the citizens of Newark, N. J., in a referendum of November, 1920, voted for a municipal heating plant, a lighting plant, a power plant, or a combination of any two or all three, the Supreme Court recently declared void the referendum, and Newark is back where it was before the vote was taken. The Court, in its decision, pointed out that "the resolution must state definitely the character of the plant necessary, and clearly indicate the purpose of the referendum." Merely to provide that the voters shall be restricted to "yes" or "no" on a general proposition of "a municipal plant for heat, light and power" is not sufficient. The city officials who have to do with the preparation of questions on which the voters have demanded a referendum will do well to consider this recent decision, and to take special care to frame the questions so that there may be no possibility of misconstruction.

Englewood Has a Unique Housing Enterprise

Broadacres Incorporated, of Englewood, N. J., is a housing development with some rather interesting features. Some Englewood people, realizing the rather discouraging housing situation in the vicinity of New York, formed an association, purchased 14 acres, divided the property into 40 lots, each approximately 80 feet wide and 120 feet deep, provided for streets 50 feet wide, and are selling the lots subject to the following restrictions:

Each purchaser must purchase two shares of stock per lot in the corporation and must submit plans of his house to the architect of the corporation for his approval. The cost of improvements outside the lot line, namely, sidewalks, streets, sewerage, water, gas, electric light, telephone mains, will be prorated. The corporation further reserves the right to reject any application. While Broadacres does not resemble the English cooperative housing experiments, it will nevertheless be watched with interest by students of housing in America because of these special features.

General Motors Trucks

GMC

G M C one-ton used as utility truck by city of Pomona, California

GMC Is Good Investment, Say Officials of Western Town

"One of the best investments ever made by this city is its G M C truck." In this manner do Mayor T. R. Ovington and City Engineer Fred C. Froehde, Pomona, California, express their appreciation for the service rendered by the little K16 Model G M C truck which acts as a general utility vehicle in all the city departments.

"First of all," says Engineer Froehde, "the G M C won out on merit at the time we made our purchase. We placed the order on strictly a competitive basis and made all of the competing trucks undergo a strenuous test. We hitched a road drag to the empty trucks, had eight or nine heavy men climb on the drag and then tried pulling that load through some mighty nasty mud. There were quite a number of trucks in the competition but the little G M C was the only one that got right down into the collar and did the trick.

On the Job Continuously

"Since we put it in service there hasn't been a day when we regretted our decision. It has been on the go continuously in all departments of the city and has never yet laid down on the job.

"Equipped with a dump body it has proven particularly useful in all classes of work, and beside caring for all ordinary hauling for the city it has been able to care for our street repair work without any assistance.

Works With Trailer

"That street repair job is some task for a truck in itself. First we load the dump body with a full load of granite screenings, which weight pretty heavy, then we hook on the asphaltum trailer that weighs almost four tons. This trailer is an ingenious contrivance that keeps the tar and asphalt heated to the proper temperature for making road repairs.

"The use of this combination makes for economy of our street repairs. First of all it has the power and the speed to get around over the city in a short time, regardless of the conditions of travel, and carries enough material to keep a crew busy all day without returning for supplies."

G M C chassis list at the factory as follows:—one ton, $1295; two ton, $2375; three and one half ton, $3600; five ton, $3950; tax to be added.

GENERAL MOTORS TRUCK COMPANY

Division of General Motors Corporation

Pontiac, Michigan

DEALERS AND SERVICE IN MOST COMMUNITIES

The Finger-Print Method of Identification in New Jersey

By Charles P. Messick

Chief Examiner and Secretary, State Civil Service Commission

THE practical value of the finger-print method of identification is again instanced by the recent ruling of the New Jersey State Civil Service Commission that appointment records of members of the uniformed police and fire departments in the several municipalities of the state shall contain finger-print records of appointees.

For a number of years the New Jersey State Civil Service Commission, as well as the municipal commission of the city of New York, has required finger-print records of applicants in civil service examinations as a means of positive identification, for the checking up of possible criminal records of applicants and for the purpose of preventing impersonation in some part of examination tests.

The New Jersey State Commission now proposes to complete the applicant's record, and insure positive identification of the appointee by requiring the finger prints as well as other data at the time of appointment. The appointee's record will then be compared with the examination record, and there will be positive assurance in every instance that the person appointed is actually the person who was earlier examined by the Commission.

The form of record required is shown in the accompanying illustrations.

Finger prints must be taken in space below for appointees in uniformed police and fire departments and such other positions as the Civil Service Commission may direct.

RIGHT HAND

THUMB | INDEX FINGER | MIDDLE FINGER | FOURTH FINGER | LITTLE FINGER

APPOINTMENT RECORD (Competitive Class)

This card must accompany the first payroll submitted for new appointees either temporary or permanent, in the Competitive Class. No payroll will be passed without this card properly filled out and signed. No permanent appointment can be legally made prior to a formal certification of eligibles.

To be filled out in writing (ink) by the appointee. Temporary appointees pending examination omit numbers 3, 4, 7 and 12.

1. Full Name: Joshua James Smith
2. Present Address: 19 Bright St Trenton N.J.
3. Address at time of Examination: Same
4. Title of Examination: Patrolman
5. Title of Position: Patrolman
6. Age: 24 1 1
7. Date of Exam.: Nov 1921
8. Date of Appt.: First July 1, 1922
9. Place of Birth: Bordentown N.J.
10. Born or Naturalized Citizen: Born
11. Place of Examination: State House, Trenton
12. Department or Institution in which Appointed: Police

To be filled out and signed by the appointing officer

I hereby certify, that I have this day appointed permanently

the above eligible to the position of Patrolman Grade First at an entrance salary of $ 1950 per annum; that the above answers are in the handwriting of the appointee (if not so stated) and that the finger prints on the reverse side of this card are those of the said appointee.

Signed: George E. La Barre (Appointing Authority)

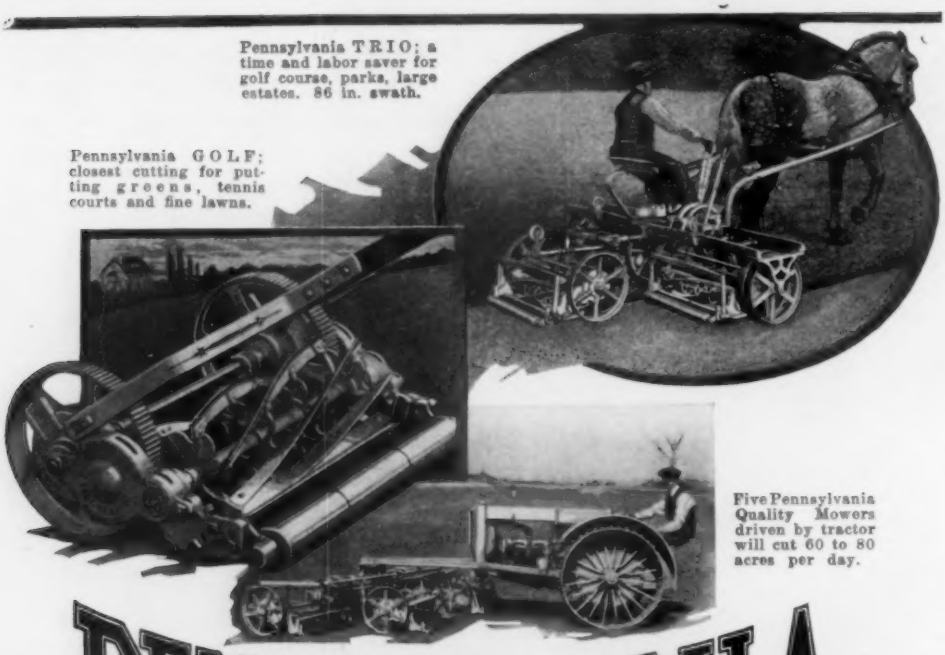
Date: July 1, 1922

SEE OTHER SIDE

FORM OF RECORD USED BY THE NEW JERSEY STATE CIVIL SERVICE COMMISSION

While no instance of impersonation in appointment has been brought to the attention of the New Jersey Commission, there is always the possibility, and for this reason the new departure respecting the appointment record has been adopted.

It is expected that this method of identification will be gradually extended, both in examination and appointment in the state and municipal service, until it shall include practically every group of positions.



Pennsylvania TRIO; a time and labor saver for golf course, parks, large estates. 86 in. swath.

Pennsylvania GOLF; closest cutting for putting greens, tennis courts and fine lawns.

Five Pennsylvania Quality Mowers driven by tractor will cut 60 to 80 acres per day.

PENNSYLVANIA *QUALITY* LAWN MOWERS

THE record of long years of service back of Pennsylvania Quality assures the utmost in operative satisfaction under any and all conditions.

Every part of every mower is made with that care and accuracy which has been the foundation stone of Pennsylvania prestige from the very start.

Designed for longest service they are the most economical lawn mowers you can buy. Their having self-sharpening, crucible, tool steel blades, is but one reason out of many for the preference of men who know what a good lawn mower should be.

Write for "Pennsylvania TRIO Book"

Pennsylvania Lawn Mower Works, Inc.
1615 North 23rd Street, Philadelphia

The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

Ordinance Requiring Installation of Automatic Sprinklers Upheld

An ordinance of the city of Chicago requiring certain classes of buildings to be equipped with automatic sprinkler systems, in the interest of fire prevention, was upheld by the Illinois Supreme Court in the case of City of Chicago vs. Washingtonian Home of Chicago, 124 Northeastern Reporter, 416. Defendant conducts an inebriates' home and successfully litigated a claim that the ordinance was unreasonable as applied to such an institution. The Court said:

"The ordinance in question is not subject to the objection urged. The sprinkler apparatus is designed to prevent the spreading of fire and to put out fires in their incipient stages, and the testimony in this record tends to establish that they are efficient in so doing. Any regulation which tends to lessen the damage and dangers of fires and prevent the spreading thereof in densely populated cities is one which tends toward the protection of life and property of the public, and is therefore, unless oppressive and unreasonable, a proper exercise of police power. The ordinance in question is not shown by the record to be oppressive in its application to appellant. It owns and is possessed of valuable property at the corner of Madison and Ogden Avenues, in the city of Chicago. This, the evidence shows, is a populous section of the city. The building is occupied by patients suffering from the effects of alcohol, making it necessary to have a large portion of the windows barred with iron grates. The evidence also shows that windows to the fire-escapes are thus grated and are padlocked. The nature of the ailment of the patients in this building is such as to make them at times unruly and difficult to handle. Especially would this appear to be true in the case of fire. The cost of the installation of this system in appellant's property is shown to be about $5,500, while the value of the property is shown by the record to be considerably over $150,000. The record also shows that a saving in insurance premiums, owing to the installation of a sprinkler system, would pay the expense of such system in approximately 30 years. Considering these facts, together with the fact that such system is a protection to the property of appellant, it becomes apparent that such requirement is not oppressive. The ordinance is general in its application. It applies to all buildings coming within the character of the one described by its terms, and therefore cannot be said to be discriminatory."

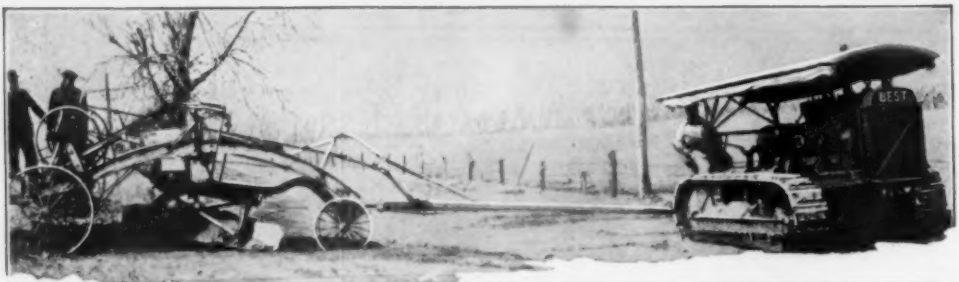
Establishment of a Sanatorium for the Tuberculous in a Residential District Restrained

The opinion of the Michigan Supreme Court in the case of Brink vs. Shepard, 184 Northwestern Reporter, 404, determines that owners of property in the residential section of a city are entitled to maintain suit to restrain establishment of a near-by tuberculosis sanatorium. It seems to follow that the decision is authority for the validity of an ordinance forbidding establishment of such institutions in residential districts. The Court says:

"The maintenance of a hospital for the treatment of this communicable disease in a strictly residential district cannot fail to deprive residents of near-by homes of the comfort, well-being, and enjoyment of their homes to which they are entitled, and this, coupled with their financial loss, justifies an appeal to a court of equity for relief."

Ordinance Requiring Permit Before Establishing a Laundry, Declared to be Valid

Clauses in the Minneapolis charter giving the city council power to make and enforce ordinances for the government and good order of the city, to regulate the construction of buildings, and to penalize creation and continuance of nuisances, are held by the Minnesota Supreme Court to support the validity of an ordinance prohibiting the operation of a laundry within the city limits without first obtaining a permit from the council. It is also decided that the ordinance is not unconstitutional as being unjustly discriminatory in that by its express terms it does not apply to buildings used for laundry purposes when the ordinance was adopted. (State vs. Dirnberger, 187 Northwestern Reporter, 972.)



DEPT. OF HIGHWAYS
OKLAHOMA COUNTY.
OKLA.

COURT HOUSE
OKLA. CITY

PHONE
MAPLE 1410

March 29, 1922.

The attached is a photograph of the BEST "60" Tractor, No. 592-A, purchased from the Cardwell-Lyman Sales Company of Oklahoma City, by Oklahoma County, on February 2, 1921.

Our records show that this tractor has been run approximately 2700 miles. It has graded 30 miles of road that had never been graded before, and 194 miles of road that had been graded; total 226 miles of road graded.

Also it has pulled stumps, dragged roads with planer, and moved approximately 8,000 cu. yds. of dirt an average distance of 300 feet.

The tractor is in perfect condition and shows very little wear.

Total repairs used on tractor to date	$ 88.25
Total gasolene and oil (including gas for operator's car)----------	1478.68
Salaries for tractor and grader operators	3318.00
TOTAL----------	$4884.93
Total number of days worked---------306	
Total expense per day----------$15.86	
Total days grading, 282 @ $15.86----------	$4472.52
226 miles road graded in 282 days, total cost per mile,----------$19.79	

This tractor has been down for repairs approximately ten hours in the total fourteen months.

Matt Peters
Tractor Operator
W. C. Potter
Grader Operator
Geo. K. Parkerson
Auditor Treasurer's Office
Ralph B. Daniels
County Engineer

SUBSCRIBED AND SWORN TO Before me, a Notary Public in and for Oklahoma County, this 29 day of March, 1922.

Gertrude E. Miller

Comm expires 6/2/25

Write for full data, prices and the names of our nearest dealers. Let us give you the details of how economically Best Tractors build and maintain streets and roads.

C. L. BEST TRACTOR CO.

SAN LEANDRO, CALIFORNIA

Distributing Warehouses

ST. LOUIS, MISSOURI
818 North Second Street

PORTLAND, OREGON
East Salmon and Water Streets

BEST TRACTORS

Municipal and Civic Publications

Prices do not include postage unless so stated

MOSQUITO ERADICATION

W. E. Hardenburg, Sanitary Engineer. McGraw-Hill Book Co., Inc., New York, 1922. IX + 248 pages, illustrations and diagrams. $3.00.

A well-written and practical treatise on the subject of mosquito eradication. A book well suited to the needs of public health officials in all parts of the country troubled with these pests. The chapters take up the diseases spread by mosquitoes and then discuss disease-bearing American mosquitoes, control measures, needs for initiating eradication campaigns, administrative aspects of the campaign, inland drainage, salt marsh drainage, oiling, the control of mosquitoes through the use of fish, screening for houses, and other measures and expedients, and points requiring investigation. The closing chapter deals with the rural mosquito and malaria control in country districts. The four appendices include a table to determine the species of certain common American mosquitoes, an approved anti-mosquito ordinance, and a suggested anti-mosquito leaflet for campaign educational work, as well as a bibliography of literature on mosquito control and eradication.

HYDRAULIC DIAGRAMS FOR THE DISCHARGE OF CONDUITS AND CANALS

Theodore Horton and the late Charles H. Swan. Third Edition, revised and enlarged. McGraw-Hill Book Company, Inc., New York, 1922. 53 pp. Price, $1.00.

The latest revision of these well-known hydraulic diagrams contains one notable change, namely, the inclusion of three new diagrams representing sections of more recent and useful types of aqueduct sections, namely, the semi-elliptical, parabolic and semi-circular sections. The new diagrams replace the one of the horseshoe section of the Croton Aqueduct, which has been omitted because of its similarity to the diagram representing the horseshoe section of the Wachusett aqueduct.

DRAINAGE ASSESSMENTS

"Drainage Assessments: Their Imposition and Their Collection Under the North Carolina Drainage Laws," by Frank Nash, Assistant Attorney-General of North Carolina. Circular No. 4 of the Drainage and Reclamation Division of the North Carolina Geological and Economic Survey. August, 1922. 11 pp. On account of the uncertainty of duties and authority of those authorized to act under the North Carolina Drainage Law of 1909, this address was given at the Twelfth Annual North Carolina Drainage Convention, at Goldsboro, April, 1922. (Apply to Joseph Hyde Pratt, Director, North Carolina Geological and Economic Survey, Chapel Hill, N. C.)

STREET RAILWAY FRANCHISE IN SAN DIEGO

"Have the People of San Diego a Voice in the Government and Control of the Street Railway in San Diego?" By Shelley J. Higgins, City Attorney. "The Common Council of the city of San Diego under its charter powers has authority, first, to regulate under its police powers the routing and operation of street cars in the city of San Diego, and, second, to insert as reasonable conditions contractual provisions in the franchise requiring that said electric railway company route and operate its cars in such manner as will best protect the public and promote the convenience, not only of car patrons, but the public at large who have occasion to use our streets." 13 pp. (Apply to author.)

THE SANITARY CONDITION OF NEW YORK HARBOR

By Kenneth Allen, Sanitary Engineer, Board of Estimate and Apportionment, Municipal Building, New York, N. Y. 10 pp. Illustrated. "The situation regarding harbor pollution has received careful and continued attention for nearly 20 years, and * * * with one exception the general features of a plan for main drainage and sewage disposal for New York are pretty well defined. * * * what has been accomplished in recent years has been in line with the general plan, so that the city will not be called upon to abandon or reconstruct the work at a later date." (Apply to author).

THE SMOKELESS CITY

E. D. Simon, Lord Mayor of Manchester, England, and Marion Fitzgerald, Formerly Sanitary Inspector and Health Visitor to the Woolwich Borough Council. Longmans, Green and Co., 39 Paternoster Row, London, E. C. 4; also New York. 1922. IX + 82 pp. Preface by Lord Newton, Chairman of the Departmental Committee on Smoke Abatement. 50 cents.

Dealing mainly with the problem of domestic smoke in Great Britain, "which is far worse and in some respects more difficult to deal with than factory smoke." A determined effort to replace "the dirty, wasteful and unscientific habit of burning raw coal," with cleaner, more economical and scientific methods. The damage done by smoke is shown and the inefficiency and discomfort of burning raw coal for household needs are made clear. Under the headings of the three services for which heat is needed in a house—warming the house, heating the water-supply, and cooking—different systems are discussed, which range from entire smokelessness down to methods which, though not completely smokeless, are labor-saving and a great improvement on the use of coal fires. Suggestions are made for work for domestic smoke abatement, under five headings—research, education of the public, cheap gas and coke, municipal houses, and prohibitive legislation. The book shows the result of detailed health inspection of homes and a sympathetic knowledge of the conditions of the housewife's daily labors.

RAMSHACKLE COUNTY GOVERNMENT

Under this title, "the plague spot of American politics" is treated by Richard S. Childs incisively. "Over all the operations of the county government lie a great pall of silence and an utter absence of public opinion." "A satisfactory solution of the many problems can be worked out only by a steady process of evolution, under conditions that give scope for experiment, free from needless Constitutional restrictions." 28 pp. 1 diagram. Published by the National Municipal League, 261 Broadway, New York, N. Y. Price 10 cents; $5 per 100. (Apply to the publishers.)

STANDARD ZONING LAW

The Department of Commerce model for an enabling act under which municipalities can adopt zoning regulations is a 20-page mimeographed document, with footnotes covering questions which might arise in the wording of various sections and provisions. It is not a Federal law, but a suggested form for state zoning enabling acts. Free of charge. (Apply to the Division of Building and Housing, Department of Commerce, Washington, D. C.)

CITY PLANNING IN ST. LOUIS

Annual Reports of the City Plan Commission of St. Louis, Mo., for the years ending April 11, 1921, and April 10, 1922. Covering the progress made in zoning and in the execution of the Major Street Plan, also legal and financial procedure on street openings and widenings, a study of traffic growth in St. Louis, and adopted regulations concerning the subdivisions of land. 26 pp. Map and diagrams. (Apply to Harland Bartholomew, Engineer, City Plan Commission, St. Louis, Mo.)

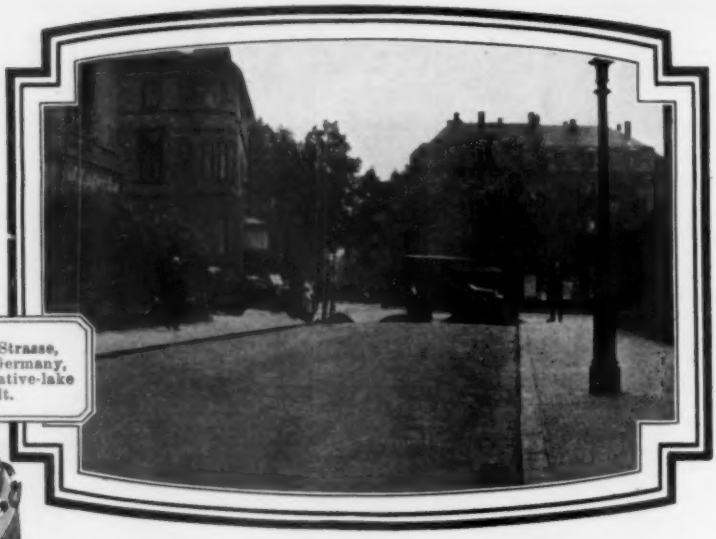
MUNICIPAL HYDRO-ELECTRIC POWER, LOS ANGELES

A review of the development of the Hydro-Electric Power System of Los Angeles, Calif., and of the operations of the Bureau of Power and Light, presented to give the taxpayers an accurate recital of the things that have been accomplished, as well as a clear conception of the future needs of the city in the way of development of its municipally-owned hydro-electric utility. 20 pp. Illustrated. (Apply to E. F. Scattergood, Chief Electrical Engineer, Bureau of Power and Light, 207 South Broadway, Los Angeles, Calif.).

ST. LOUIS MUNICIPAL BRIDGE

"The Municipal Bridge of St. Louis—A Record of Municipal Effort." By William E. Rolfe, Associate to the President of the Board of Public Service, St. Louis, and Lucius H. Cannon, Librarian, Municipal Reference Library. Published by the St. Louis Public Library, August, 1922. Price, 15 cents. 34 pp. Illustrated. (Apply to publishers.)

Around the World on Native-Lake Asphalt



Adlerflycht-Strasse, Frankfurt, Germany, paved with native-lake asphalt.

TWENTY-FIVE YEARS and more of service—under the most severe conditions of climate and traffic—is common record for Trinidad and Bermudez Native-Lake asphalt streets in all parts of the world.

Sun-baked, wind-swept and storm-beaten for ages in the tropics, these nature-made asphalts have been seasoned and toughened for long-lasting, low-cost service on modern streets and roads.

Millions of square yards of native-lake asphalt roads and pavements, in fact, have resisted traffic and disintegration by the weather for OVER THIRTY YEARS, at a maintenance cost of less than a cent per yard per year. Think of it! No other bituminous material has ever approached this record.

That's why a native-lake asphalt street or road is a sound, conservative investment of public funds—not a speculation.

Write at once for booklets describing these remarkable world-old native-lake asphalts.

The Genasco Line includes asphaltic roofing, flooring, paints and allied protective products. Write for descriptive matter.

New York
Chicago
Pittsburgh

THE BARBER ASPHALT COMPANY
PHILADELPHIA

St. Louis
Kansas City
Atlanta
San Francisco

TRINIDAD LAKE ASPHALT

When writing to Advertisers please mention THE AMERICAN CITY.

Methods, Materials and Appliances

News for City and County Engineers, City Managers, Water-Works Superintendents, City Controllers, Park Superintendents, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

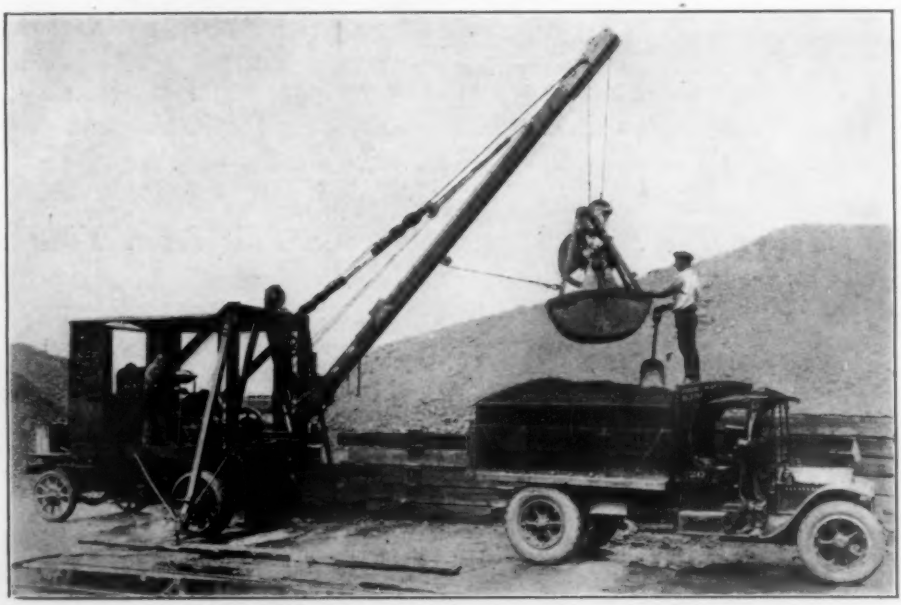
A Service Crane for Snow Removal

There has been an increasing call from cities for cranes that can be put to various services and which can propel themselves readily. This call has led the Byers Machine Company, Ravenna, Ohio, to bring out a crane that can be permanently mounted on a motor truck. The new outfit, called the "Byers Truckrane," can be driven from the garage to the job every morning as an automobile, or driven from one job to another, with a minimum of time loss in travel. The crane unmounted weighs only 6 tons and is similar to the Byers Auto Crane Model No. 1 in every respect except that it has no wheel, jack-shaft or differential and drive chain. It has a power drop for raising and lowering the steel bolts. The crane is furnished with a Hercules 4-cylinder, 4 x 5-inch gasoline engine, developing over 30 horsepower. Any half-cubic-yard bucket weighing not over 2,000 pounds can be used with it, or a special clam-shell of 1-cubic-yard capacity for snow removal. It is not necessary to use a new truck for the mounting. One that has seen 90 per cent of its usefulness having an engine capable of turning over is all that is needed.

The capacity and speed of this outfit, as well as its easy mobility from one section to another, make the use of such a crane in city snow removal particularly important.

Fuller Retires from Hazen, Whipple & Fuller

On September 1, Weston E. Fuller, a member of the firm of Hazen, Whipple & Fuller, consulting civil engineers, 30 East 42nd Street, New York City, withdrew from the firm to accept a position as Professor of Civil Engineering at Swarthmore College. Mr. Fuller will also do outside work as he has time. The firm name will again be Hazen & Whipple, the other partners remaining and the business being conducted under that name, as before. E. W. Doebler will be associated with Mr. Fuller.



A CITY SERVICE CRANE ADAPTABLE TO ALL-YEAR WORK

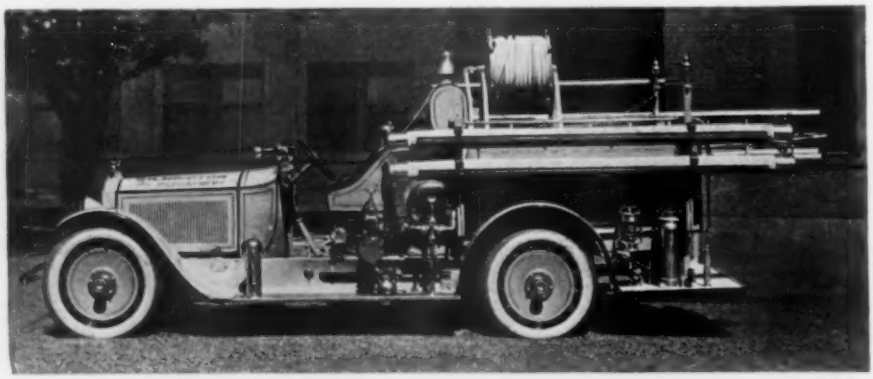
1583 ALARMS

Answered With No Trouble

John C. Mark, Chief of Fire Department, Lima, Ohio, says, "During January, 1916 the city of Lima placed in service a Northern equipped combination. Since this time the car has responded to 1583 alarms without the slightest imperfection developing in either machine or equipment and in no instance has this car ever failed to reach its destination."

Lima is now using eight Northern equipped commercial trucks under the able direction of Chief Mack.

He says further, "I would personally recommend them to any city wanting the best to be had in fire fighting equipment."



A Packard—Northern 750 gallon triple is shown above.
We can furnish other guaranteed pumpers from 150 gallons up.

You Can Buy Fire Apparatus Like This from Your Local Dealer

No need for you to go outside your own community to buy. Your own local business men in whom you have absolute confidence can sell you a complete motor driven fire truck that will give the kind of service Chief Mack tells about.

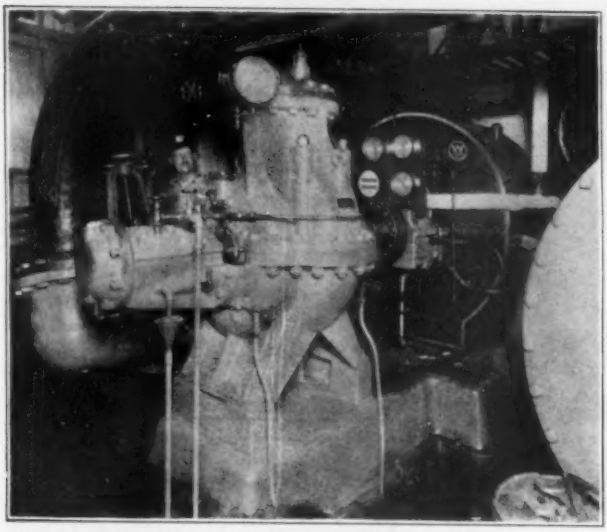
Over three hundred and fifty cities are satisfied users of Northern equipped Commercial Trucks.

NORTHERN ROTARY PUMPS
"MORE GALLONS PER HORSE POWER"

Buy from your local business men.

Northern Equipments and Pumps can be installed on any chassis.

NORTHERN FIRE APPARATUS CO.
MINNEAPOLIS, MINNESOTA. U.S.A.



PUMPING UNIT ON THE "THOMAS WILLETT," ONE OF THE NEW YORK CITY FIRE-BOATS

Protecting New York's Water-Front from Fire

Protecting the ships in the harbor of New York City and their thousands of passengers and millions of dollars' worth of cargo; co-operating with the land forces of the Fire Department to fight fires at the piers and buildings near the water-front; and being always ready for emergency calls that may require the most exacting tests of the personnel and apparatus, are the problems faced by the Marine Division of the New York Fire Department. This division has a fleet of 11 fire-boats, the most powerful of their kind in the world. The "Thomas Willett" and "James Duane" at separate times within the past few months have had their pumping equipment changed over to a two-unit installation of Lea-Courtenay horizontal-shaft, single-stage, centrifugal pump of special high-pressure design, directly connected by a flexible coupling to Westinghouse horizontal turbines of 600-horse-power rating.

The specifications of the new apparatus called for a capacity over the old system and also called for guarantees to cover the discharge of 3,600 gallons of salt water per minute at a pressure of 175 pounds per square inch, and 4,500 gallons at 150 pounds pressure when operating at a speed of 2,000 r.p.m. When the two units operate in series, they develop 300 pounds pressure at the pumps and discharge 4,500 gallons of salt water per minute, and when in parallel, 9,000 gallons per minute at 150 pounds pressure. The two steam turbines are supplied with a total of 25,000 pounds of saturated steam per hour at a 200-pound pressure, exhausting into a condenser with a vacuum of 26 inches, under which conditions the turbines do not exceed 550 horse-power, leaving a 10 per cent additional rating for an overload.

Women City Officials Approve Road Grader

At one of the recent demonstrations of the Road Razer, made by the Avery Company, Peoria, Ill., the Mayor and four councilwomen witnessed the work of this machine and wrote the following letter:

THAYER, KANS., August 9, 1922.

Avery Company,
Peoria, Ill.

GENTLEMEN:

It has been a pleasure and an education along the line of road building to this day witness a demonstration of the work of your Avery Road-Razer on the streets of our city. The work was perfection, leaving our streets like a boulevard.

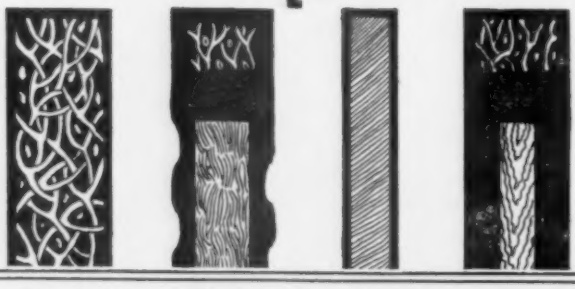
We are greatly pleased with the machine and most heartily recommend it for all dirt streets and roads.

Very truly yours,

ABBY H. FOREST, Mayor,
MRS. EUNICE ROSH, MRS. DAISY SAVAGE,
ALLIE LAMBERTSON, IVY W. CROSS,
Councilwomen.

MAYOR AND COUNCILWOMEN OF THAYER, KANS.

Servicised Expansion Joints



MONITORS OF THE ROAD

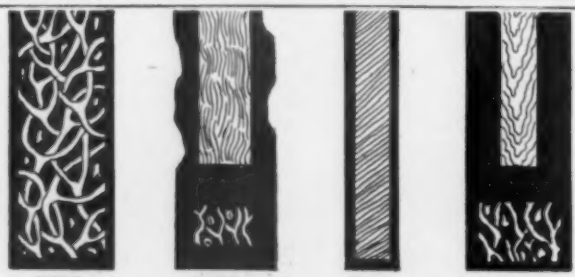
Old principles of expansion joint provide fillers of solid asphaltic content or impregnated fibre and asphalt in an elastic mass. ¶ The fundamental purpose of the filler is to re-occupy the space left by two contracting slabs. ¶ Solid asphaltic or impregnated fibrous materials contract, concrete slabs likewise contract on cooling. ¶ Three contracting bodies cannot occupy the same space as when expanded. Servicised Joints *expand* when the concrete slabs contract. ¶ This is the key to a permanent waterproof joint; a correct answer to the problem of expansion between two contracting bodies. Unimpregnated cellular fibrous matter in Servicised Joints brings about this re-expansion after compression is relieved.

Trapped Under Compression: The print to the right is an example of oozing under compression. Due to the hard asphalt surfacing over the concrete base, the traffic could not carry the surplus away because it was locked in between the asphalt surfacing and base. The force was great enough, however, to form bulges in the hard asphalt surface.

Write Us About Your Expansion Joint Problems

A Bituminous and Impregnated Fibre or Elastic Mass: No better proof of indiscriminate oozing. No better illustration of the need of expansion joint of the proper kind. The action in this instance resembles that of paste in a tube being squeezed with one side open. Action of this kind causes tremendous waste, without resulting in good. Servicised Joints will prevent this.

Servicised Products Co.
First National Bank Bldg.
CHICAGO



TYPE B — 75% Bitumen, 25% Cellular Fibre

TYPE D — Self-Expanding Non-Raising

TYPE C — Felt Center—Coated Sides—Sidewalk Joint

TYPE AA — 3/16 Veneer Core

Four Types of Servicised Expansion Joints in Which the Oozing Tendency Is Controlled

© 1920

Servicise the Crevice and Save the Road

Ace Wins Time Trials in Philadelphia

Over a measured course of one mile of rough, wavy payment, an Ace motor-cycle, made by the Ace Motor Corporation, Philadelphia, Pa., won the two speed tests conducted by the Police Department as a requirement in submitting bids for supplying motor-cycles to the Philadelphia Police Department. The purpose of the contest was to demonstrate the capability of the machine for police service.

The riders were given a start of a quarter-mile to get up speed, and then were timed over a stretch of a half-mile, measured by the city surveyor, and had another quarter-mile to slow down in after crossing the finish line. The stretch covered a really rough pavement, including several wicked holes, which had to be dodged. Also, a street car track was crossed just before traversing the starting line. The side-car trial was run first. As each driver's turn was called, he drove his machine down to the end of the stretch and turned, getting up full speed well before he crossed the starting line. The same police officer traveled as a passenger in the side car of each machine as tested.

The Ace motor-cycle covered the half-mile with a side-car in just 31 seconds. The speed trial, using the machine only, gave 22 2/5 seconds for the same machine. In addition, a slow-speed test was made, driving the machine on high gear with the clutch fully engaged, under the observation of an automobile load of police officials, who drove alongside the motor-cyclist and watched the operation of the machine. In this test the Ace also showed to advantage, taking 4 minutes and 11 4/5 seconds to travel the measured half-mile course.

The test was conducted by the following city officials: Director of Public Safety J. T. Cortelyou, Director of Welfare Warburton, Purchasing Agent T. S. Armstrong, Assistant Purchasing Agent H. S. McFadden, and Captain Harry Schultz of the Traffic Squad.

THE MOTOR-CYCLE THAT WON IN THE PHILADELPHIA POLICE DEPARTMENT TESTS

Hill & Ferguson Dissolve

A notice has been received announcing the withdrawal of S. F. Ferguson from the firm of Hill & Ferguson, 112 East 19th street, New York City. The practice of the firm is to be carried on by Nicholas S. Hill, Jr., at the same address.

Mr. Ferguson has announced that he will take a long vacation before again entering active business or professional work. Since September 1, his office address has been 10 East 44th street, New York City.

A New Asphalt Filler

The Solvay asphalt filler, which has recently been brought out by the Solvay Process Company, Syracuse, N. Y., is composed of raw crushed limestone, ground to a degree of fineness, such that from 70 to 75 per cent or more will pass through a 200-mesh screen. The fineness depends upon the specifications which it must meet. This asphalt filler is used principally for dusting asphalt and other bituminous pavements immediately after the surface is

A Money Saver For Every City In The Snow Belt

WHEN the big snows come Model "W" Industrial Cletrac hooks onto road machine or plow and starts digging, and it keeps "on the go" till every road is open.

Mr. John Webster, Street Commissioner of Bangor, Maine, writing of the performance of a Model "W" Industrial Cletrac during a period of severe storms, says:—"Yesterday we broke out three miles of cross streets and back roads, over which there has been no travel, snow ranging from three to five feet deep. I would conservatively estimate that the Cletrac will do the work of six or eight horses."

The experience of Bangor is typical of many municipalities throughout the snow belt. And, of course, all these cities find plenty of off-season work for their snow-fighters—such as road scraping, ditching, park maintenance, excavating and paving.

If your city faces an unusual snow-removal problem, investigate the record of Model "W" Industrial Cletrac. Interesting examples and convincing figures will be furnished gladly on request.

Cletrac

EASY ON A TRACK
THE CLETRAC WAY

HARD THIS WAY, BUT—

THE CLEVELAND TRACTOR CO.

Largest Producers of Crawler Tractors in the World

19205 Euclid Ave. Cleveland, Ohio

rolled. Inasmuch as asphalt fillers are relatively cheap and freight rates high, the sale of the Solvay filler is limited to central New York and northern Pennsylvania.

Ornamental Iron Street Lighting Standards

It is rapidly becoming the standard in street lighting practice to do away with unsightly wooden poles and overhead wires that mutilate shade trees and mar the beauty of city streets. Boulevard lighting brings safety from accident and crime, and also increases the attractiveness and beauty of streets. The iron lighting standards made by the Drake Manufacturing Company, Inc., Friendship, N. Y., are being installed by a large number of progressive cities and villages. These standards are made of cast iron with sides ¼-inch in thickness. They are guaranteed to withstand frost, rust, and the shock of impact. One of the popular styles and sizes is illustrated herewith. The hexagonal standard is made in heights of 9 feet 5 inches, and 11 feet, with 18-inch base, and the fluted standard is made in the same sizes but weighs slightly more per standard.

The lighting standard shown is equipped with General Electric diffusing glass globe and canopy. All standards are arranged for General Electric Form 8 Novalux units, but the Form 9 unit can be used if desired, with an adaptor. All the standards have a door at the base to allow bolts to be fastened and underground cables to be connected with the wire which leads inside of the pole up to the lighting unit and socket. The socket forms an automatic cut-off and receiver for the incandescent bulb and globe.

A Pressure Road Oiler Mounted on a Trailer

A pressure road oiler which has certain advantages over horse-drawn and motor truck pressure oilers has been developed by the Austin-Western Road Machinery Company, 400 North Michigan Boulevard, Chicago, Ill. This trailer oiler can be pulled by either a truck or a tractor and consequently does not tie up so large an investment in a single machine as the oiler unit mounted on a motor truck. It retains the high-speed feature of the truck type, which is very desirable when the work of oiling is being done some distance from the source of oil supply. There is a certain speed beyond which oil cannot be applied successfully, but on the run to and from the base of supply the trailer saves much valuable time.

Trailer oilers are arranged for rear control, the only outstanding difference between those mounted on motor trucks and the trailer units being that the pump on the trailer oiler is driven from the rear wheels, as in the case of horse-drawn machines. The trailer oiler is furnished in two sizes, with tank capacities of 750 and 1,000 gallons. The oiling unit is substantially constructed, having a tank riveted in the same manner as locomotive boilers and fitted with baffle plates. The truck trailer is of the heavy-duty type that is always used where working conditions are unusually severe. It has a strong and heavy frame, roller bearing wheels and special springs. These outfits are so arranged that the complete oiler units can be removed from the trailer chassis without difficulty at the end of the oiling season and the latter used for other purposes if desired.

Plans for School Grounds

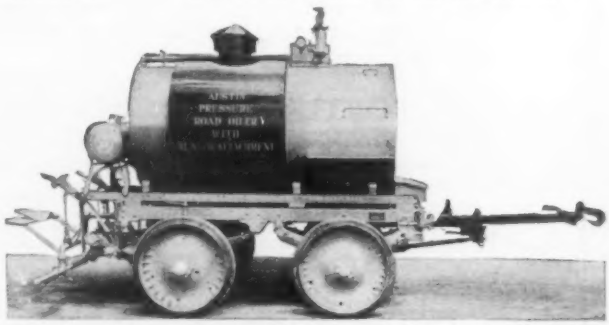
E. S. Draper, landscape architect and city planner, 11 East 5th Street, Charlotte, N. C., has been retained by the Fletcher Memorial School, McColl, S. C., to develop plans for the improvement and extension of the grounds, including the location of new buildings.

Filtration Plant Contractor

F. B. Leopold, one of the best-known men in the filtration industry, has recently opened an office in the House Building, Pittsburgh, Pa., and will conduct a business as contractor and builder of municipal filtration plants, gravity filters, pressure filters and water softening plants.

Century Brass Works, Inc.

Effective the middle of October, the Twentieth Century Brass Works, Belleville, Ill., changed its corporate name to the Century Brass Works, Inc. This makes no change in the personnel of the ownership or officers, or in the business policies of the corporation.



HANDLING ROAD OIL BY TRAILER

Eighty-six Cement Manufacturers Unite to Serve You

The Portland Cement Association means this: that valuable scientific, advisory and educational work which no one cement manufacturer could reasonably undertake alone is at your disposal. This means that you can be absolutely sure of yourself in using Concrete.

You can be sure in the first place of the cement you buy. Any manufacturer of Portland cement may join the Association, and no manufacturer has to belong to it. But Association By-Laws require that members' products shall measure up to the high standard of specifications of the United States Government and the American Society for Testing Materials. Cement bought from a member of the Association is therefore dependable.

You can be equally sure of the way to use it. If you want information about its usefulness under certain conditions, or about how to mix it or place it to get the best results most economically, you can get it from any one of our 24 offices, one of which is near you.

Supplying dependable information without charge, by booklet, or by personal correspondence or by conference when necessary, is the work of the Association. To supply it authoritatively, the Association maintains a large research laboratory and a staff of more than two hundred engineers.

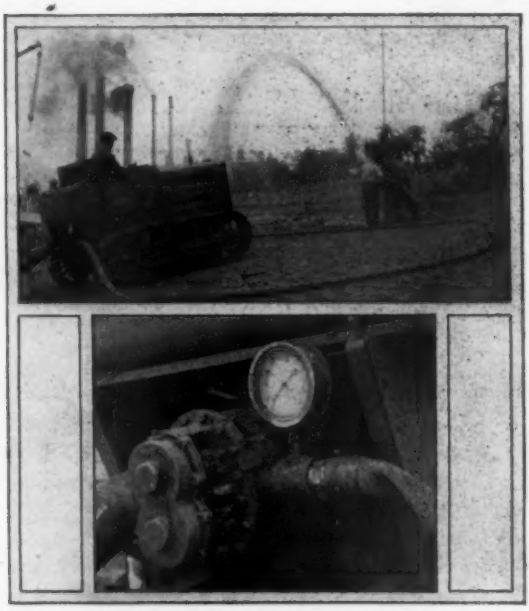
The Association is, in effect, the joint research and educational foundation of 86 manufacturers of cement in the United States, Canada, Mexico, Cuba and South America. You are invited to use it freely.

Suggestions as to how our work may be made more useful to you are invited.

PORTLAND CEMENT ASSOCIATION

A National Organization
to Improve and Extend the Uses of Concrete

Atlanta	Des Moines		Parkersburg	San Francisco
Boston	Detroit	Los Angeles	Philadelphia	Seattle
Chicago	Helena	Milwaukee	Pittsburgh	St. Louis
Dallas	Indianapolis	Minneapolis	Portland, Oreg.	Vancouver, B.C.
Denver	Kansas City	New York	Salt Lake City	Washington, D.C.



A FIRE STREAM FROM A TRACTOR, AND THE PUMP

Pump Attachments for Tractors

A unique and very practical accessory in the form of a rotary pump which can be attached to the standard 5-ton "Caterpillar" tractor has been placed on the market by the Holt Manufacturing Co., Peoria, Ill. The pump is of special design, compact in size, and is attached to the rear of the tractor in the same position as the power pulley attachment. It is driven direct through the countershaft from the motor and is capable of delivering 220 gallons of water per minute under a working pressure of 100 pounds per square inch. At the normal speed of 1,000 r.p.m. it throws a 1⅛-inch stream 100 feet in the air and requires but 26 horse-power, which is only approximately two-thirds of the normal motor capacity of the 5-ton tractor.

This reserve capacity makes possible the use of a long hose, both for suction and discharge. When an ordinary length of hose is employed, a very broad area can be quickly drenched with a heavy stream. One special field of usefulness is in patrol work in forests and other timber districts, as well as for emergency fire protection in lumber camps. The tractor has the power and capacity to travel over all sorts of ground, and is able to penetrate to points inaccessible for other machines and vehicles. Where a stream or other water is available, the tractor with pump attachment can render vitally important service in forestry work.

This outfit is also available as an auxiliary for fire department service and for pumping out cellars which have been flooded; as an auxiliary for irrigation work and for use by contractors in pumping out excavations, trenches and cofferdams. The pump is of the rotary gear wheel type, with all working parts mounted in a heavy cast iron case, which preserves its alignment. The whole pump weighs only 225 pounds.

An Improved Street Can

Every progressive city is making some provision for keeping the streets clean and sanitary through the installation of serviceable street cans into which trash may be thrown. The Butler Manufacturing Company, St. Anthony Falls Station, Minneapolis, Minn., has recently placed on the market an improved street can which is both artistic and serviceable. It was originally modelled after the official Minneapolis can and has now been adopted by Minneapolis as its official can.

This can, illustrated herewith, can be shipped knocked down at third-class rates, packed three in a crate, each crate weighing approximately 300 pounds. The Butler can is 38 inches high above the 4-inch standard, is 18 inches deep, 26 inches wide, and made of 20-gage galvanized material. The can is painted both inside and out, the regular color being green, but, if desired, the cans can be shipped unpainted at a correspondingly lower price. A gunny sack is hung on the hooks inside to receive the trash as thrown in. It can be readily removed and an empty one substituted, thus making it unnecessary to tip up the can when emptying it. The gunny sacks are not furnished by the manufacturer, as they can usually be bought as cheap locally.

A STREET CAN IN WHICH WASTE PAPER "STAYS PUT"

How Philadelphia Handled Last Winter's Snow

On January 29, 1922, Philadelphia experienced an 18-inch snowfall in which the street cleaning department had its first opportunity to thoroughly test its snow-fighting organization and equipment. Very careful plans had been made for the most effective use of each piece of equipment and personnel. Charts were made showing the assignment of work, dumping locations, etc., in the central districts of Philadelphia.

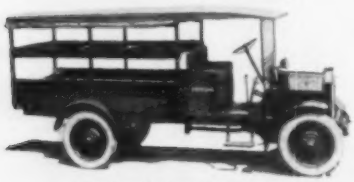
For the removal of snow in the down-town district, plows, operated like road graders with

—a FEDERAL Fast Express

Federal Fast Express with Panel Express Body

Federal Fast Express with Grain Body

Federal Fast Express with Screen Express Body



Federal Fast Express with Huckster Express Body

Federal Fast Express with Standard Stake Body

---with just the right body for any quick delivery need

Because of the extraordinary demand for the reliability, endurance, economy and unusual speed of the FAST EXPRESS, Federal now equips this sturdy chassis with 32 body combinations.

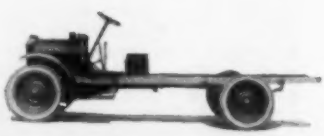
Many of these bodies are readily interchangeable. There is a style that will best accommodate every haulage requirement of the light delivery field. Federal bodies are mounted and painted, ready for instant service when the truck is delivered.

Mounted on the new FAST EXPRESS chassis, whatever body you select will insure you of a truck without equal in the light delivery field. It is powerful, dependable, enduring, and genuinely economical—and capable of a speed of 35 miles per hour.

Before you buy a light-delivery truck, see the Federal FAST EXPRESS.

FEDERAL MOTOR TRUCK COMPANY
Detroit, U. S. A.

Chassis of Fast Express



Another FEDERAL

When writing to Advertisers please mention THE AMERICAN CITY.

VIEW OF LOADER AT WORK AND CLOSE-UP OF RECEIVING END

the motive power furnished by trucks and tractors and trolley cars, were used to open up the streets. Snow was then removed by motor trucks loaded either by hand or by means of a loader made by the Barber-Greene Company, Aurora, Ill. One of the accompanying illustrations shows a Barber-Greene loader which attracted considerable attention. This was the first machine of this type to be used in Philadelphia for snow removal. It loaded a 5-ton truck in a minute and a half and averaged 25 trucks per hour. By hand it took 12 men 20 minutes to load the same truck.

The other illustration shows the manner in which the snow is scooped up and fed to the belt conveyor, which elevates it and finally dumps the snow into the truck. The machine is run by gasoline and operated by one man. One to three laborers are used to clean up and work with the machine.

New Pumper at Long Beach, Calif.

The city of Long Beach, Calif., recently purchased an Ahrens-Fox pumping engine, which was exhibited by the Ahrens-Fox Fire Engine Company of Cincinnati, Ohio, at the recent San Francisco Fire Chiefs' Convention. On the acceptance test the engine worked very successfully. The engine, a Model K-4, was immediately placed in service. It has a capacity of 750 gallons per minute and is operated by a 4-cylinder motor, booster equipped. The pumper was sold by John P. Ahrens, Vice-President of the Ahrens-Fox Fire Engine Company.

Gas Street Lighting

We are advised that the following places installed additional Welsbach gas street lamps during the month of September: Kenmore, N. Y.; Worcester, Mass.; Yonkers, N. Y.; Palmyra, N. J.; Springfield, Ohio; Washington, D. C.; South Orange, N. J.; Glen Ridge, N. J.; St. Louis, Mo.; Camden, N. J.; Boston, Mass.; Baltimore, Md.; and Memphis, Tenn.

Engineer for Electric Plants at Muscatine and St. Charles

Arthur L. Mullergren, consulting engineer, Kansas City, Mo., has been retained by the city of Muscatine, Iowa, to prepare plans and specifications and supervise the construction of the municipal electric light plant and distribution system and the electrification of the water pumping-station, for which bonds of $350,000 have been voted. Mr. Mullergren is also preparing a report, estimates, plans and specifications for a complete new water pumping-station for St. Charles, Mo.

Source of Street Lighting Material

The article, "Minneapolis Investigates Street Lighting Conditions," which appeared on pages 338-340 of the October, 1922, issue of THE AMERICAN CITY MAGAZINE, was abstracted from a report of the Public Lighting Committee of the Minneapolis City Council, of which W. C. Buck, Alderman, was Chairman.

Offices of THE AMERICAN CITY MAGAZINE to Be Located at Fourth Avenue and 30th Street

Readers and advertisers who have assisted in the steady growth of THE AMERICAN CITY MAGAZINE from year to year will be interested to learn of the removal of our New York office from the Tribune Building, 154 Nassau Street, to larger quarters in the Fourth Avenue and 30th Street Building, 443 Fourth Avenue, New York City. This will bring our offices closer to the large railroad terminals and hotel district, and we trust will make it possible for still more of our out-of-town friends to visit us when in New York. In our new location we shall occupy the entire tenth floor, thus enabling us to arrange our Editorial, Advertising, Circulation and Service Departments to better advantage. This change of address will be effective December 1, 1922.

A REAL CUSHION TRUCK TIRE

At the left is seen the famous All-Weather Tread and the Indented Sidewall of the new Goodyear Cushion Truck Tire. Right—a cross-section showing the Goodyear Patented Hollow-Center

Goodyear has produced a real cushion truck tire embodying both the original Goodyear Hollow-Center Cushion and the famous All-Weather Tread.

It unites in one tire the resilience of the cushion, the wearing quality of the solid, and the tractive power of the All-Weather Tread.

It is a development of the standard Goodyear Hollow-Center Cushion Tire, more than 30,000 of which have been proved in actual service during the last five years, and it is a distinct advance on that splendid tire.

The Goodyear All-Weather Tread Cushion Tire has a pressed-on base that defies base-separation troubles.

Its tread is the powerfully tractive All-Weather Tread design, insuring sustained headway under all road and weather conditions, saving fuel and engine strain by its sure gripping.

Its triple cushion design makes it a real shock absorber, resilient beyond any other tire excepting the pneumatic. It has the advantage of the patented hollow-center, the high, thick blocks of the All-Weather Tread, and a new sidewall pattern that permits easy compression under pressure.

The Goodyear All-Weather Tread Cushion Tire is made in all standard sizes, up to and including 7 inches, and is specified for all-'round equipment on light and medium duty vehicles and as front wheel equipment with Goodyear All-Weather Tread Solids on the rear, for heavier trucks.

For further information, write the Government Sales Department at Goodyear, Akron, Ohio, or Los Angeles, California.

In placing orders for new apparatus, you should definitely specify this Cushion, unless your needs are for Goodyear All-Weather Tread Solids or Goodyear Cord Truck Tires

GOODYEAR

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